

New
Transit
Authority

MEMORANDUM

Copies sent to:

Confidential *CMK*

Date

April 23, 1984

TO:

Messrs. Bernard, Broshous, Casanova, Feeley, McIver, Miller, Nelson, Meehan,
Wynn, Ziegler

FROM:

David L. Gunn, President *[Signature]*

SUBJECT:

NEW YORK CITY TRANSIT AUTHORITY'S STRATEGIC PLAN

Attached you will find a draft version of the subject plan. The draft version is broken into three chapters. The three sections are the introduction, the reasons and definitions of the problem that we face and finally solutions. This Strategic Plan must be a document which the key line managers in the Authority view as a blueprint for turning the Transit Authority around.

It is essential that those managers addressed and copied on this letter play an active role in determining the strategies to be followed in their respective areas. This plan should be finalized within the next three months.

Each individual addressed and/or copied on this letter will be responsible for preparing a section to be included in the Strategic Plan outlining their goals and objectives aimed at correcting the problems the Authority faces. The General Superintendent level managers should forward their strategies to their respective Vice President and General Managers for forwarding to the Sr. Vice President of Operations.

Obviously, the solutions contained in this Strategic Plan involve a longer time frame, i.e. ten years, than a budgetary process. However, the solutions proposed in the Strategic Plan must be consistent with our 1985 budgetary goals and objectives currently under development.

Draft strategic plan submissions should be forwarded to me via the chain of command for review six weeks from today or Monday, June 4th. Individuals who feel the need to discuss this matter should feel free to contact me via the chain of command.

cc: Roberts
Kalkhof
Bromfield
Broderick
Goodlatte
Stanford
Mombach
Ferretti
Pontillo
Karagheuzoff

*Don't Rescind
Shapiro - Shapiro*

INTRODUCTION

*15:00
out*

This paper presents a plan for halting the deterioration of the New York City Transit system and for positioning the Transit Authority to provide safe, reliable, and clean public transportation for New Yorkers. The fundamental strategies outlined are intended to move the TA from its current position of crisis management to a more stable position. Accordingly, this is not a strategic plan in the classic sense in that it does not outline the strategies that the TA will use to deal with the challenges and problems of the next decade. Instead, it is a plan for how the TA is going to handle the very pressing problems of the next three to five years.

Reversing the decline of the TA's service and infrastructure, equipment, and facilities demands the Transit Authority's full attention and efforts. By making the necessary managerial and operational changes we will ensure that we have the organizational structure and reliable, well maintained system that are required to deal with the issues of the next decade.

As is very apparent to bus and subway riders, the mass transit service provided by the Transit Authority has deteriorated over the last decade. The extent of the decline in service as well as the poor condition of many parts of the Authority's vast system is assessed in Chapter I. This chapter also indicates the magnitude of the task of returning the system to an acceptable level of performance.

discussed in Chapter II, the reasons for the decline in service and the condition of the system were a lack of capital investment in and maintenance of the Authority's cars, buses, facilities, and infrastructure; and a management structure incapable of properly operating and maintaining a transit system.

See
w/Title
S. 100
Investments
1970-1975

The problem of insufficient capital funds has been resolved (at least in the near future) by the Five Year Capital Program.

TOC S. 100

However, the management problems remain and will prevent improvements in the Authority's service unless solved. Thus, Chapter II identifies the problems which the TA must overcome.

Chapter III describes a limited number of strategies that will be followed to improve, over the next few years, the conditions facing the Authority and its riders today. Goals are not quantified because the organizational structure and programs are not presently in place to support them. Even though goals can not be quantified at this time, it is probable that our riders will see noticeable improvements in service in three to four years if the strategies described are successfully followed. The last chapter does, however, list some "milestones" that we intend to reach and indeed must reach on the way to improving service. The achievement of these milestones will be an indication that we are beginning to solve the problems we face.

Precise

Expected

443
30000
improvement
in the
thirteen

I. THE CONDITION OF THE SYSTEM

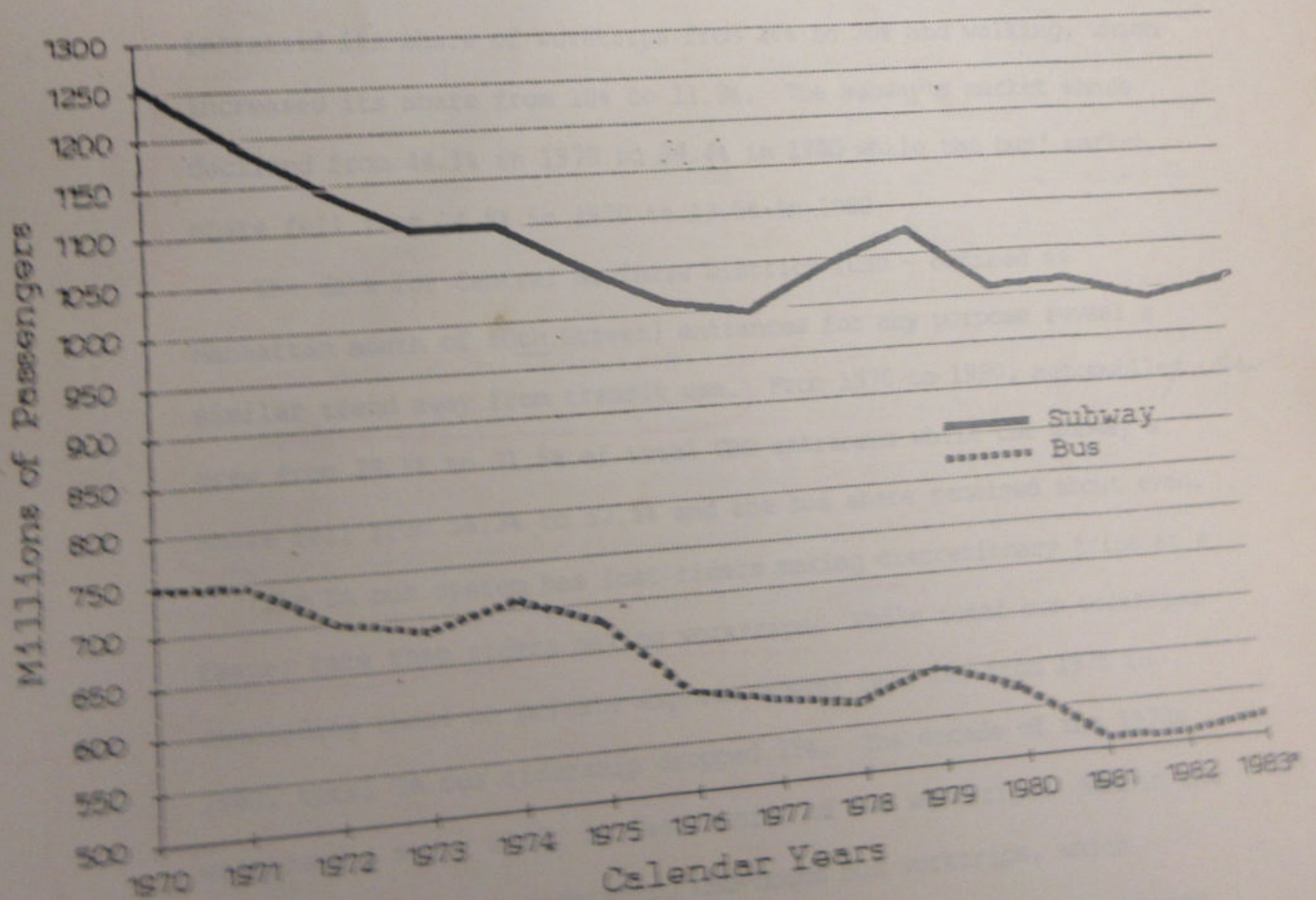
The New York City mass transit system is very extensive and provides service to most parts of the City almost round the clock. It is one of the largest systems in the world and one of the most convenient in terms of routing. On the subway system, passengers can board at any of 465 stations in four boroughs and travel by any of 26 lines. Free transfers between intersecting lines are permitted at 50 locations, and free transfers to and from particular bus lines exist at 12 stations. The bus system is accessible from any of approximately 12,000 bus stops. The Transit Authority operates 198 local bus routes and 23 express bus routes, serving all five boroughs. Many bus routes are designed as "feeder" routes to major subway lines.

The subway system and many bus routes operate on a 24-hour schedule, seven days a week. Generally, the intervals between subway trains are two to five minutes at rush hours, ten to fifteen minutes at midday, weekends, and evenings and twenty minutes from midnight to 5 a.m.

The Transit Authority's service, infrastructure, and equipment have deteriorated over the last decade. This has been a hardship for the 5 million daily riders who are dependent on the City's mass transit system for their transportation to work or recreation. Indeed, the New York City economy is very dependent on a reliable bus and subway system to transport great numbers of people.

Since the New York transit system is so large and so essential to the City economy, the deterioration that has occurred is all the more serious. Partly as a result of the poor state of service, ridership has fallen to historically low levels. In 1982, both subway and bus ridership fell to the lowest levels in the post World War II era, as shown on the following graph:

IT
doesn't
show
that



* Based on preliminary data.

The Transit Authority lost 21% of its subway ridership and 25% of its bus ridership from 1970 to 1980 partly because of population losses and partly due to shifts to other modes — probably resulting from poor transit service and increased fares. The Census Journey to Work data indicate that slightly more than half (55%) of the decline in worktrips by both subway and bus was due to the 10.4% drop in City population between 1970 and 1980. The remainder (45%) of the decline in the TA's worktrip share was caused by workers shifting to other modes. The modes New Yorkers shifted to were automobiles, which increased its share of worktrips from 26% to 30% and walking, which increased its share from 10% to 11.3%. The subway's market share declined from 44.1% in 1970 to 39.4% in 1980 while the bus' market share fell from 14.8% in 1970 to 13.5% in 1980.

The data for Central Business District (CBD - defined as Manhattan south of 60th Street) entrances for any purpose reveal a similar trend away from transit use. From 1970 to 1980, automobiles *use* grew from 29.1% to 31.5% of total CBD entrances while the subway's share fell from 56.3% to 52.5% and the bus share remained about even.

The TA bus system has lost riders making discretionary trips at a faster rate than riders making worktrips. While total bus worktrips (including those on private express buses) fell 16% from 1970 to 1980, total TA bus ridership dropped 25%. The decade of the 1970s witnessed a major shift in destination of bus worktrips. Within the overall loss in bus ridership, CBD-bound bus worktrips, which includes express bus ridership, grew 50% while other bus worktrips fell 28%. The largest losses in bus worktrips were in Manhattan and Brooklyn, which have little express bus ridership.

Total subway ridership fell 21% from 1970 to 1980, while subway worktrips fell 19%, indicating a larger drop in discretionary riders. The decline in subway worktrips was spread evenly among CBD-bound, intra-borough and other inter-borough riders. About three-fourths of the Citywide decline occurred in the Bronx and in Brooklyn.

Transit riders switched to other modes, despite sometimes larger expenditures of money, energy, and time. Walking is cheaper and healthier but is typically slower and is possible for relatively few workers. Automobile ownership is expensive in New York City but increased from 18% of City population in 1970 to 20% of population in 1980.* Automobile ownership is highly correlated with nonuse of the bus and subway to go to work. Express bus ridership increased from 3.7 million in 1970 to 29.4 million in 1980 despite the fact that riders must pay more than three times the cost of the subway. Surveys indicate that assurance of a seat, air conditioning in the summer, no need to transfer, personal safety, and convenience, in that order, are the reasons people ride express buses during rush hour periods. Three-fourths of the express bus riders use private buses and one-fourth use TA buses.

Refuse?

ie auto use is correlated with auto ownership

* Needs to be verified.

A. Service

There has been noticable decline in most aspects of the service that the Transit Authority delivers to the public. The current condition of service on the system is most graphically illustrated by a few measures and the extent to which they have deteriorated.

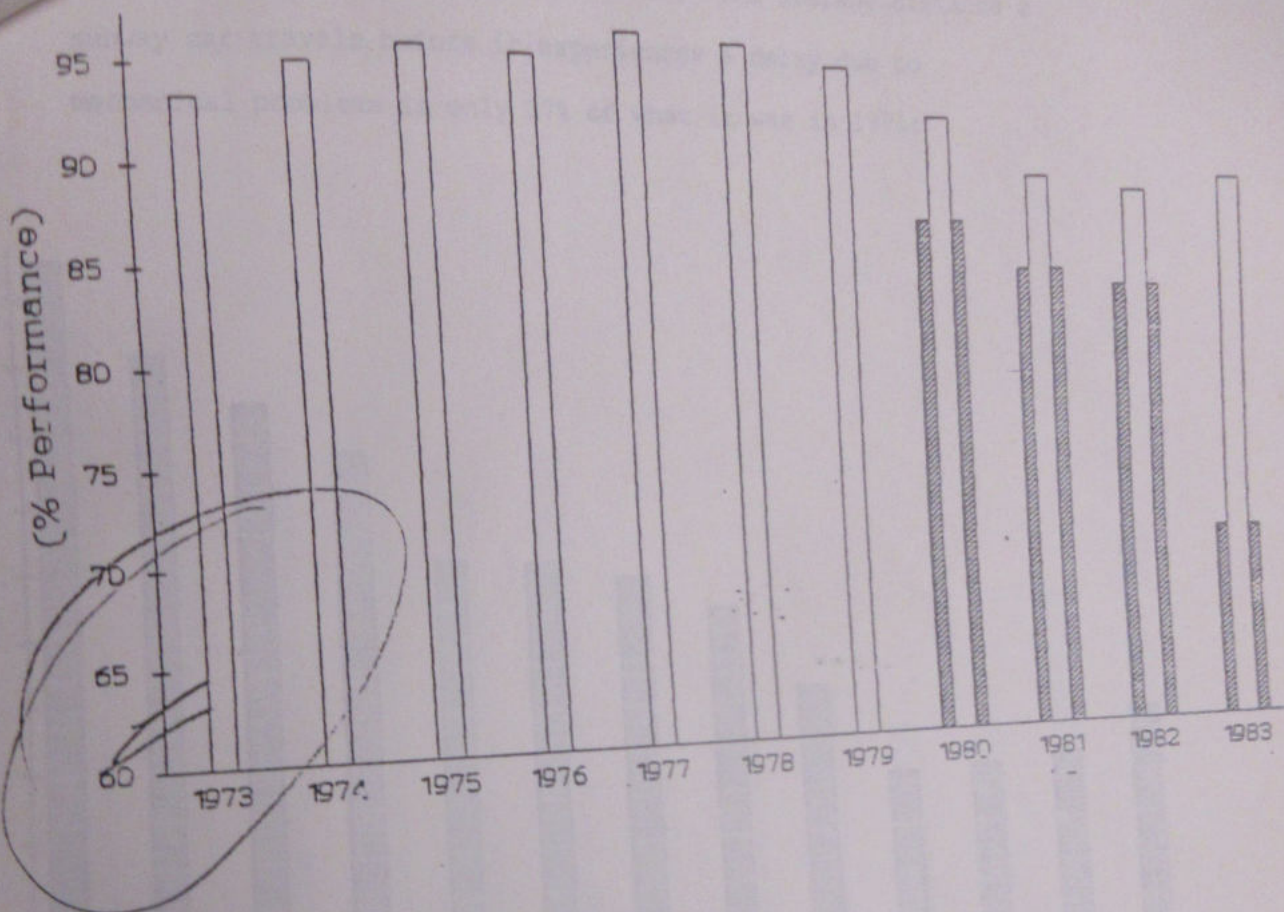
For example, on-time performance has declined considerably.

The percentage of trains arriving at their terminals within four minutes of their scheduled arrival times has fallen from 95% in the mid-1970s to 90% in 1983. This is due in part to a doubling of the number of delays on the system over this period. These on-time performance figures exclude those trains that are late because of scheduled system maintenance. If trains late because of system maintenance are included, then the number of trains arriving at their terminals less than five (instead of four) minutes late fell to 71% in 1983.

No. of
train bump
late double
bet. mid 1970's
to 1983

order -
this issue

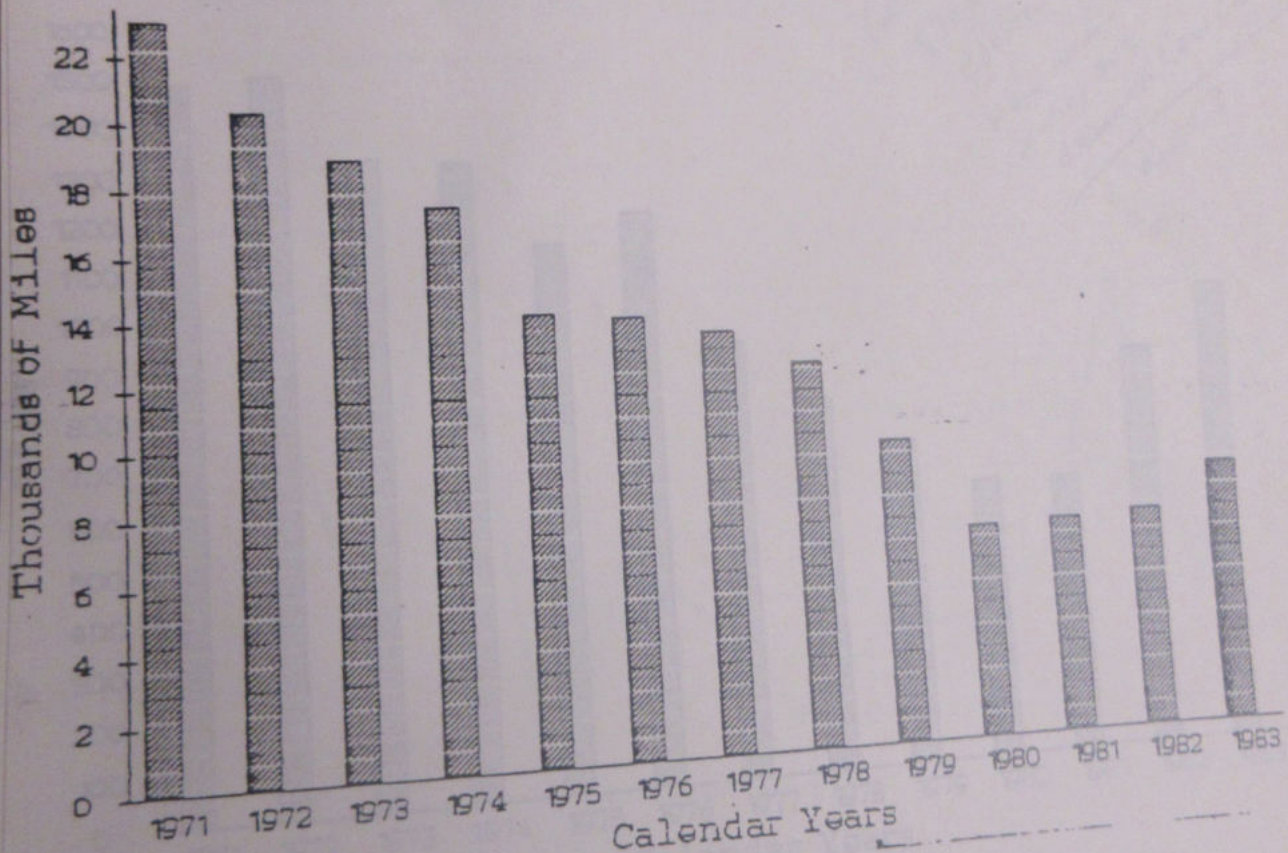
□ Overall Schedule Efficiency (FY)
▨ On-Time Performance (CY)

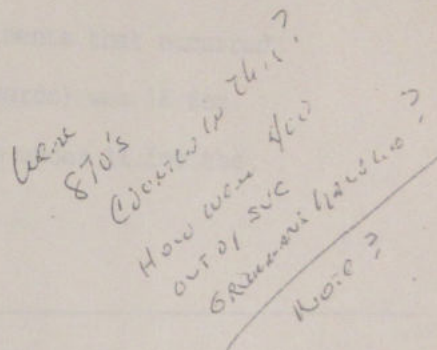


Scale Break

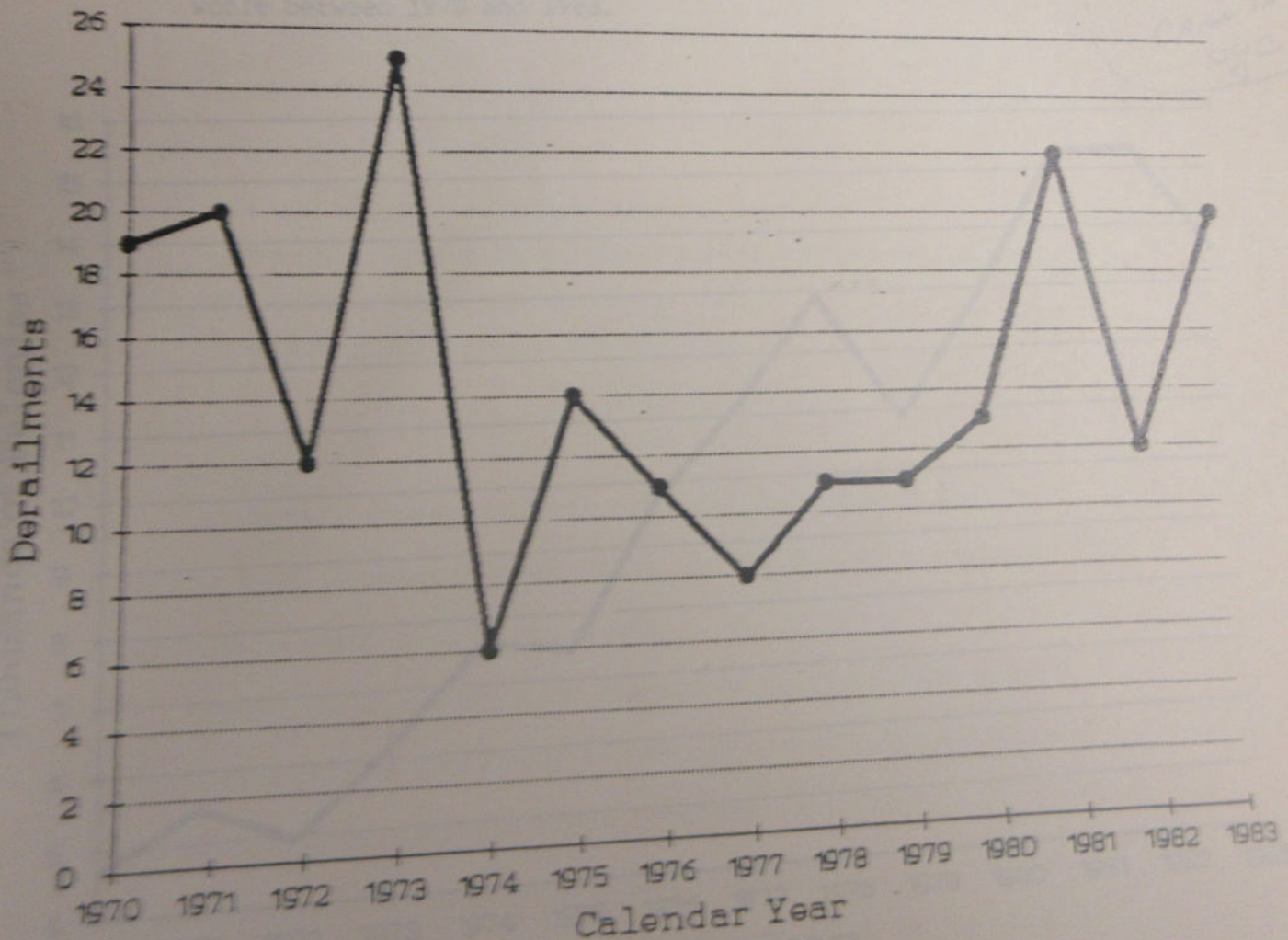
Note: Overall schedule efficiency is defined as the percentage of trains arriving at their terminals within four minutes of their scheduled arrival times and excludes trains late because of system maintenance. On time performance is the percentage of trains that arrive at their terminals less than five minutes behind schedule.

The drop in on-time performance has been accompanied by a major increase in equipment breakdowns. The average distance a subway car travels before it experiences a delay due to mechanical problems is only 37% of what it was in 1971:



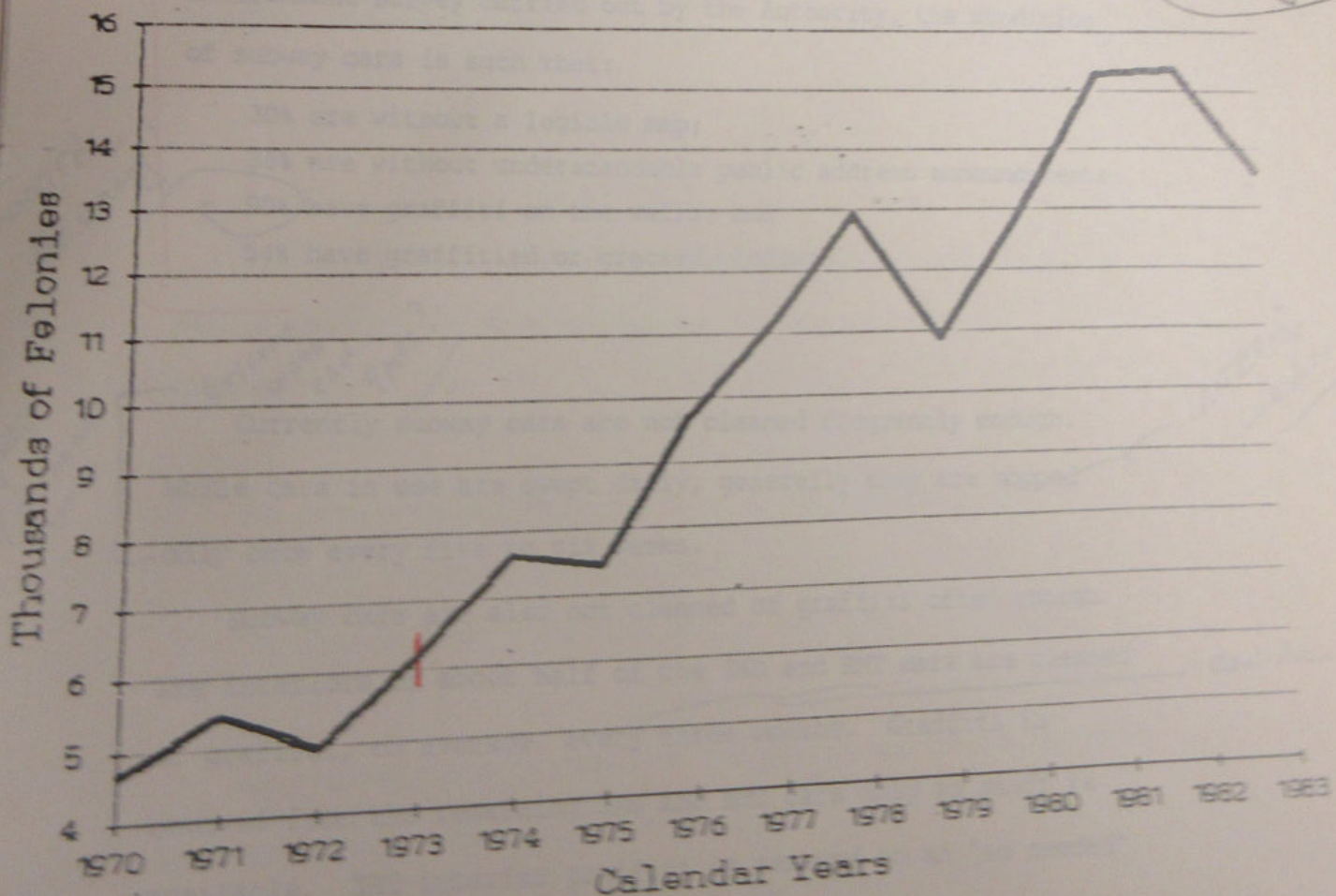


More serious service problems are reflected in the increase in derailments. A derailment is a potentially dangerous occurrence that raises the question of the safety of the subway system. The annual average number of derailments that occurred on mainline track (as opposed to tracks in yards) was 18 for the three-year period 1981-83 as compared to under 11 for the previous seven-year period:



The security of mass transit passengers has declined along with the other measures of service quality. Reported crime on the subway system has increased dramatically as the number of felonies committed on the system and in the stations increased almost threefold between 1970 and 1983. This 193% increase in the number of felonies committed in the subway system far exceeded the 20% increase in felonies in New York City as a whole between 1970 and 1983.

CAN WE
GUESS
CRIME IN
NYC?



The environment that surrounds passengers using mass transit is an indicator of the state of the system. Here, too, there has been a large decline so that the current condition of the system is entirely unacceptable. Passengers are exposed to an environment in subway cars, stations, and buses that is dirty, graffitied, littered, and often vandalized. Surveys by the Authority and by private groups have repeatedly pointed out these inadequacies.

For example, according to the ^{1984 First} ~~1983 fourth~~ quarter Passenger Environment Survey carried out by the Authority, the condition of subway cars is such that:

- 30% are without a legible map;
- 36% are without understandable public address announcements;
- 90% have graffiti on the walls; and
- 54% have graffitied or cracked windows.

Currently subway cars are not cleaned frequently enough.

While cars in use are swept daily, generally they are mopped only once every five to six weeks.

Subway cars are also not cleaned of graffiti often enough.

The interiors of about half of the IND and BMT cars are cleaned of graffiti, on average, every three months. Graffiti is removed from the remaining IND and BMT cars only as staff is available. IRT interior graffiti is removed on an "as needed" basis, that is if the graffiti obscures signs, windows, or maps, or if it is obscene.

GOTTA
Be a good
w/ car
w/ car

Exterior
wash
eod
qmos?

INTERIOR
CRACKED

Car's Re

The exteriors of cars are scheduled to be washed every four weeks when the temperature exceeds 40 degrees (eight months of the year). Recent data indicate that of the cars washed, only one-third are graffiti (or chemical) washed and two-thirds are detergent washed.

Another reason for the poor state of cleanliness of the cars is that there is not enough yard storage area to store the subway fleet securely. Today, 33% of the TA's trains are stored in mainline locations easily accessible to vandals and graffiti offenders. — AND Relatively inaccessible to wash crews.

The appearance and level of passenger amenities on buses is better than on the subways, but can still stand much improvement:

- 22% have kneeling features that do not operate properly;
- 28% have interior graffiti; and
- 79% have dirt or road film on the exterior.

Bus cleaners are expected to sweep each bus once a day and to "rapid wash" each bus exterior nightly. In five depots, however, bus exteriors are manually washed each night by cleaners; in the others, buses are driven through automatic bus washers.

B. System Infrastructure and Rolling Stock

The parts of the transit system not seen by riders suffer from extensive and pervasive deterioration. Years of neglect of the subway infrastructure directly affect operations and are reflected in the service declines. For example, the number of train derailments increased greatly in 1983 due to increases in track deficiencies and for reasons related to car equipment.

Some specific examples of today's "behind-the-scenes" conditions follow. The examples demonstrate the extent of the work needed to return the country's largest and most heavily used transit system to an adequate state of repair. Although only the track, elevated structures, repair facilities and rolling stock are discussed here, deficiencies currently exist in many elements of the system. For example, signal systems, while functioning with relative reliability, are old and often date back to the opening of the lines they serve.

→ Sample
of Age
& Life

Surveys of track conditions indicate that roughly half the subway and elevated tracks need extensive component replacement or complete reconstruction within the next seven years.

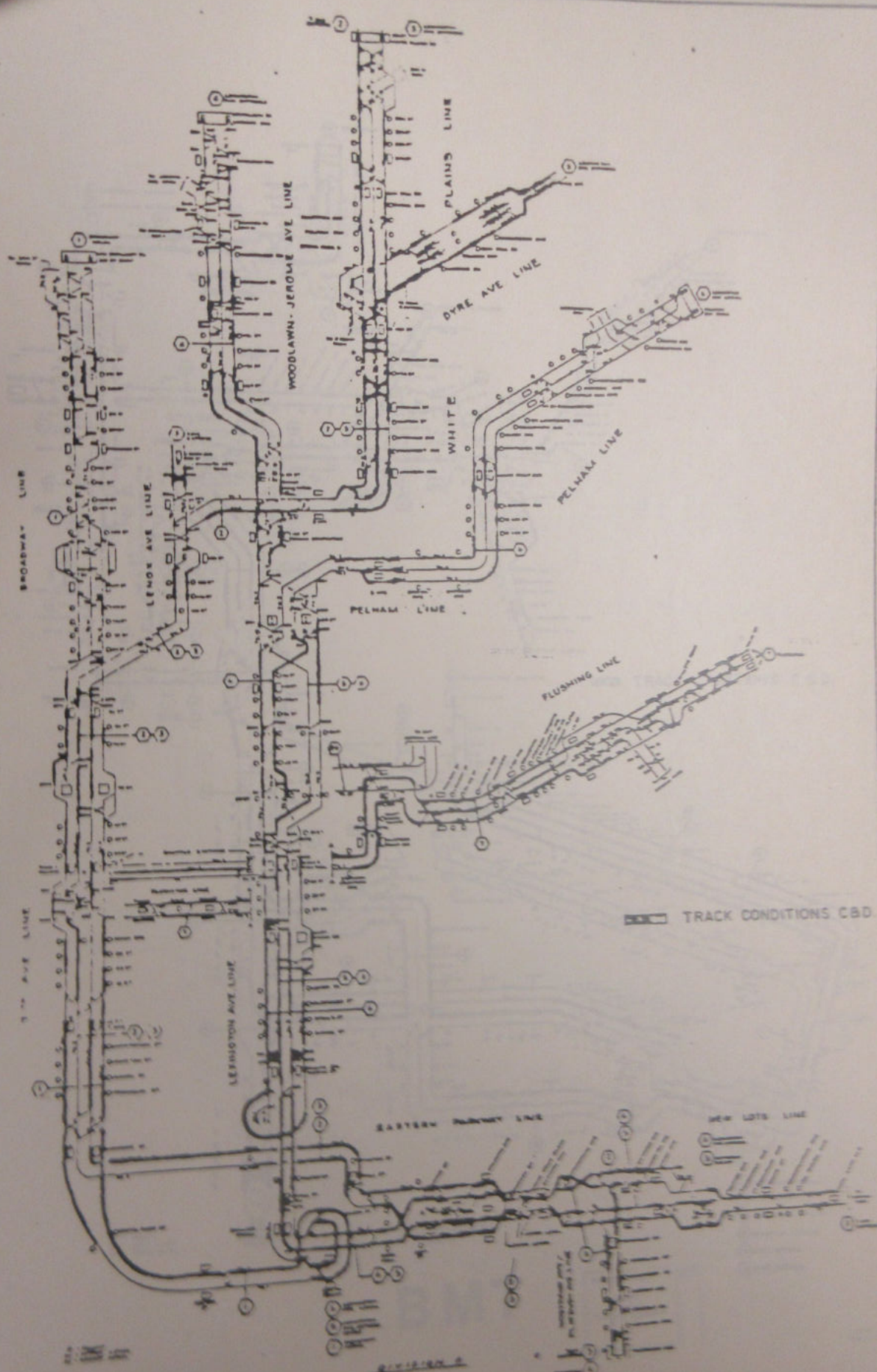
In 1983, evaluations were made to classify track segments into these categories:

- A/B - track that will remain in good condition for the next seven years.
- C - track that will need extensive replacement of rails, ties, and other components within seven years.
- D - track that will need complete reconstruction within seven years.

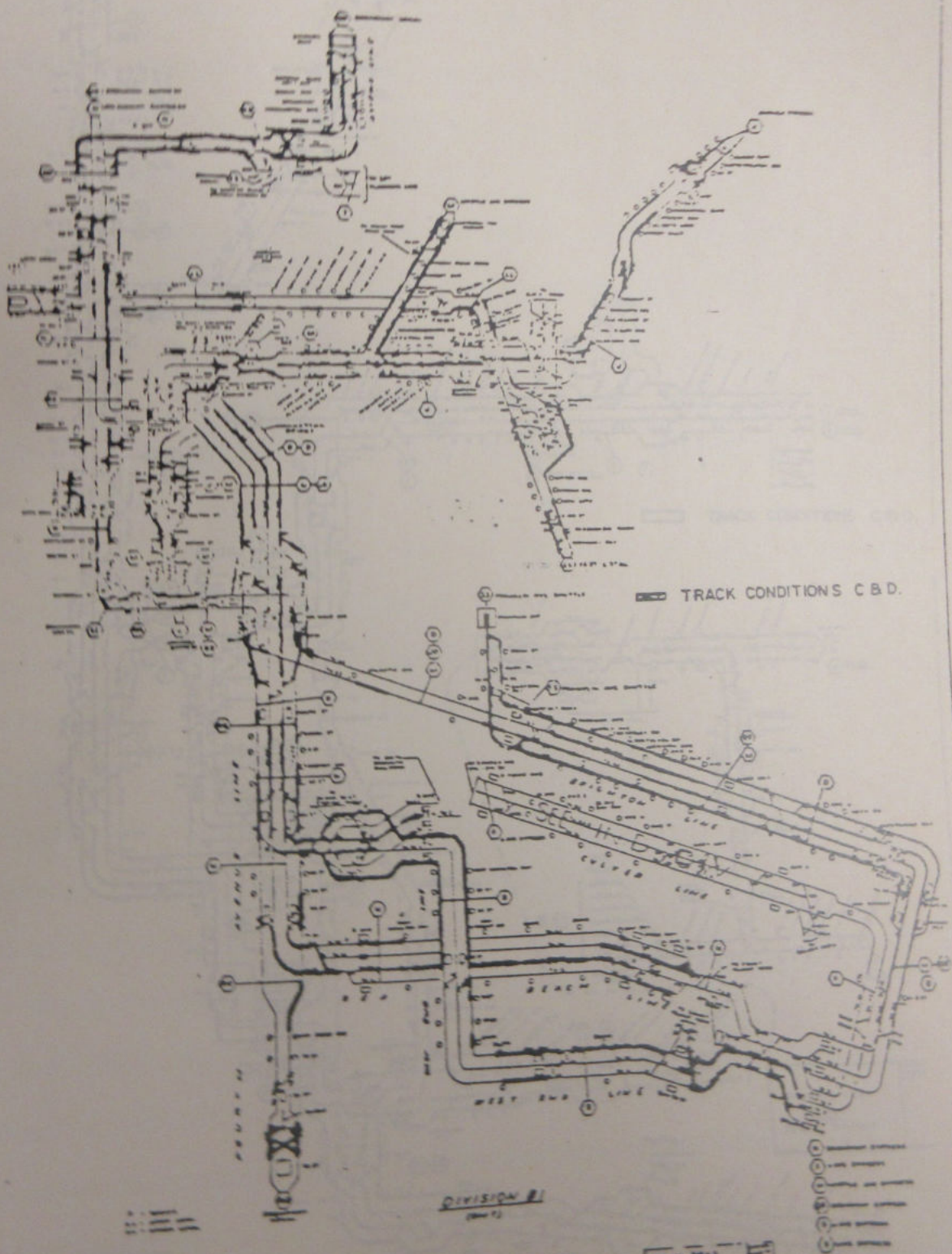
*Considerably
(3:10 - 4:11)?*

Track conditions were examined by the TA's Maintenance of Way Department and by two consulting firms. Their results, which differ somewhat due to judgemental factors involved in such a rating system, show that "C" and "D" condition track and switches constitute about 300 miles, nearly half of the system. At the request of the TA, nine track inspectors from the Federal Railroad Administration have begun a two-week inspection of the track to help determine the actual condition of the TA's tracks. *from necessary the*

The specific locations of the renewal and reconstruction work necessary are given in the following three maps:

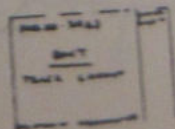


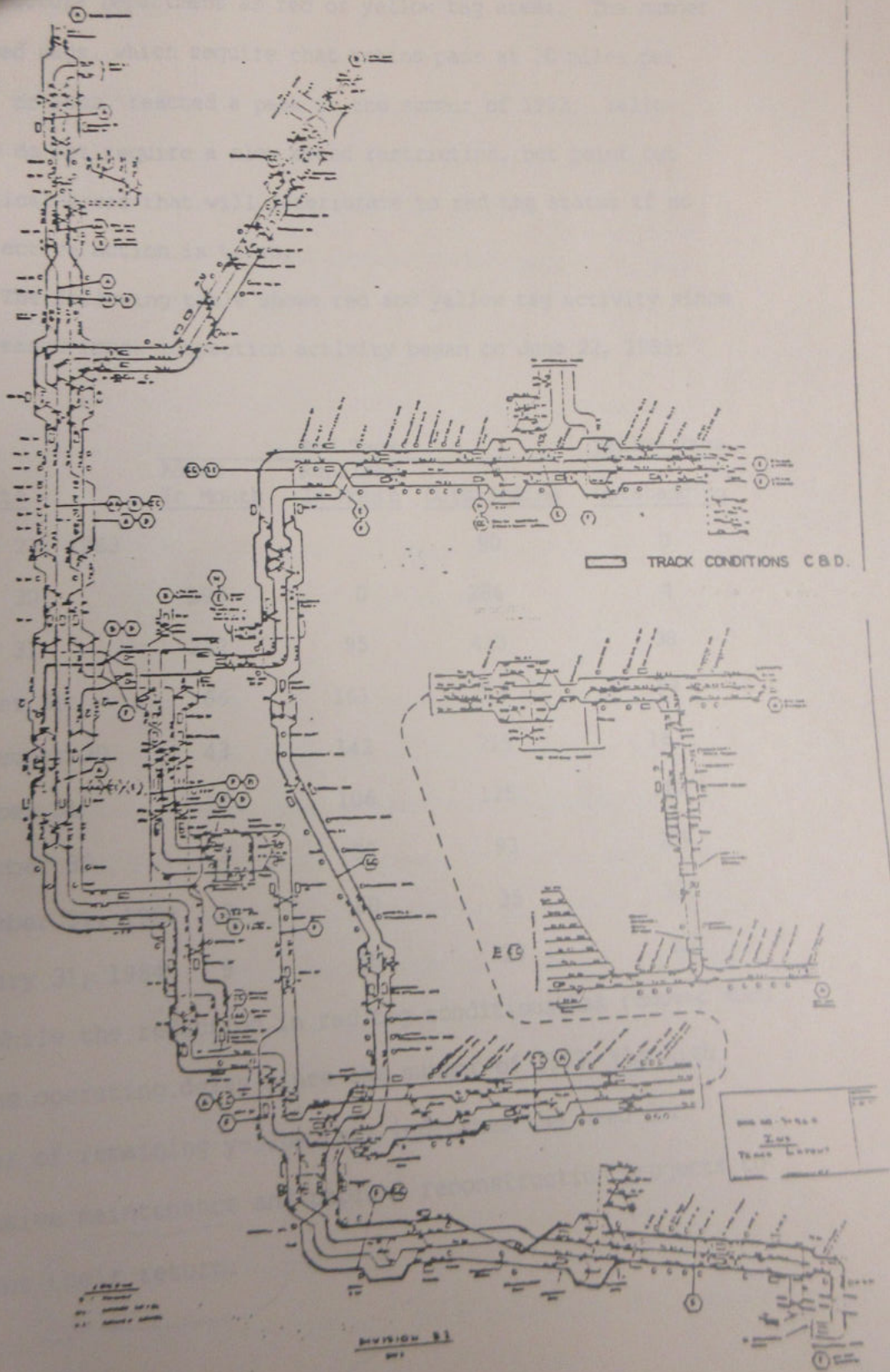
IRT



Chambers

BMT





IND

Locations of specific track defects are marked by the Track & Structure Department as red or yellow tag areas. The number of red tags, which require that trains pass at 10 miles per hour or less, reached a peak in the summer of 1983. Yellow tags do not require a slow speed restriction, but point out critical areas that will deteriorate to red tag status if no corrective action is taken.

The following table shows red and yellow tag activity since increased track inspection activity began on June 22, 1983:

<u>Date</u>	<u>Red Tags</u>			<u>Yellow Tags</u>
	<u>Added In Month</u>	<u>Repaired In Month</u>	<u>Outstanding</u>	<u>Outstanding</u>
June 22, 1983			90	0
June 30	196	0	286	4
July 31	222	95	413	38
August 31	66	161	318	99
September 30	43	142	219	167
October 31	12	106	125	282
November 30	4	36	93	299
December 31, 1983	2	60	35	328
January 31, 1984	9	16	28	330

While the reduction in red tag conditions has removed much of the operating delay since the summer of 1983, the high number of remaining yellow tags indicates the need for extensive maintenance and capital reconstruction projects to prevent their return.

Elevated Structures

About 180 miles of track are supported by 58 miles of elevated structures. These structures are also in need of extensive repair to correct structural defects.

The Structures Division, through visual inspection, has determined that there are:

- o 611 defects in structural spans that require immediate attention ("A" defects); and
- o 8,811 additional but less serious defects in structural spans ("B" defects).

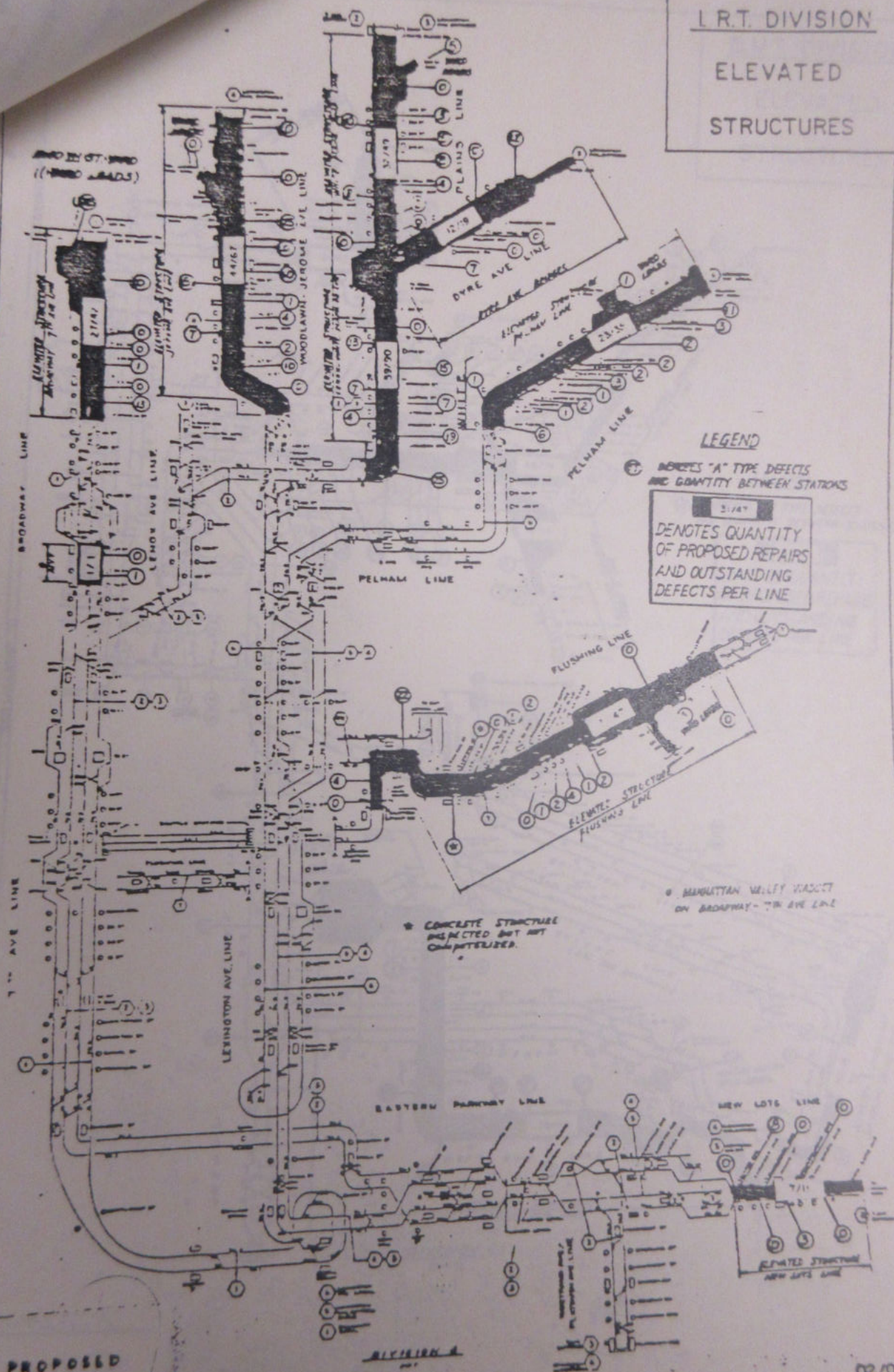
Approximately 27% of the structural spans in the system have known, visible "A" defects. Structural defects that cannot be seen, such as those present on covered surfaces in elevated stations or sections of beams underneath tracks, have not been reported. A selection of hidden structures in station areas will be opened up to survey the condition of such areas and to repair flaws that are discovered. So far, it has been found that in many cases when the structures are opened the extent of disrepair is greater than anticipated based on visual inspections.

The locations of A defects on elevated structures in the three rapid transit divisions are detailed in the following three maps:

L.R.T. DIVISION

ELEVATED

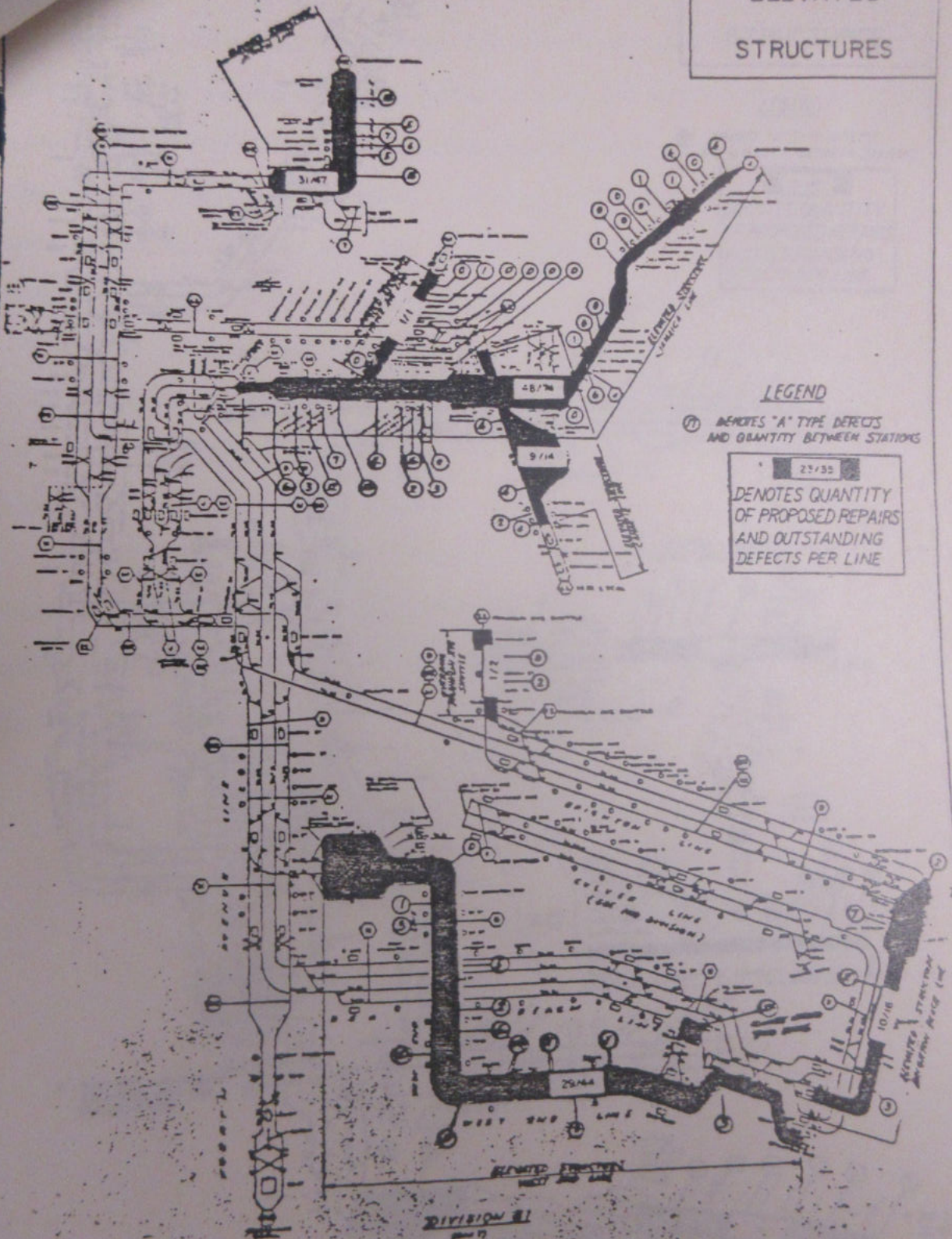
STRUCTURES



B.M.T. DIVISION

ELEVATED

STRUCTURES



PROPOSED
X REPAIRS

02/06/84

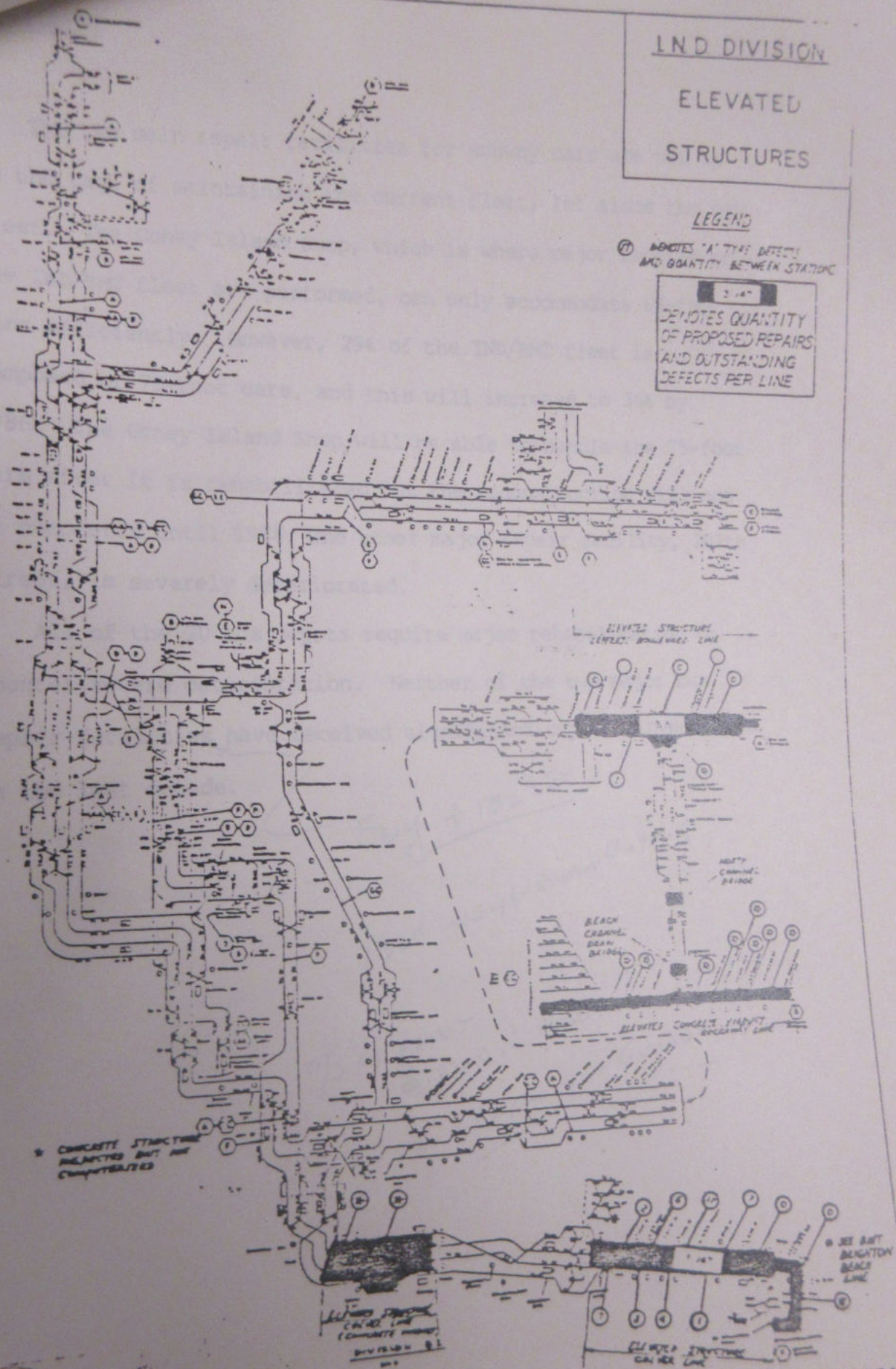
IND DIVISION

ELEVATED STRUCTURES

LEGEND

⑦ INDICATES "A" TYPE DEFECTS
AND QUANTITY BETWEEN STATIONS

2 1/4"
DENOTES QUANTITY
OF PROPOSED REPAIRS
AND OUTSTANDING
DEFECTS PER LINE



Facilities

The two main repair facilities for subway cars are not up to the task of maintaining the current fleet, let alone the new fleet. The Coney Island Shop, which is where major repairs on the IND/BMT fleet are performed, can only accommodate 60-foot cars efficiently. However, 29% of the IND/BMT fleet is composed of 75-foot cars, and this will increase to 36% by 1986. The Coney Island Shop will be able to handle the 75-foot cars after it is rehabilitated but the reconstruction will not be completed until 1986. The other major repair facility, 207th Street, is severely deteriorated.

All of the 20 bus depots require major rehabilitation to counter severe deterioration. Neither of the two major bus repair facilities have received significant capital investments in the last decade.

ENY + 132⁴⁵

132d insufficient capacity

o/o of fleet stored in street
No capacity in Garage

Bus Fleet

3740 w/
1570
INTC
Reserve

At the present time, the TA is 75-100 buses short of the 3,252 required to operate daily peak service. This is due to the retirement of 851 Grumman Flexible buses in February 1984, which reduced the active bus fleet by about 20%. The Flexibles were retired as a result of the problems that have plagued them since they were purchased in 1980. Until more buses are added to the fleet, there will be disruptions in the normal rush hour bus service.

Recalled
to be
scrapped

The retirement of the Flexibles has forced the TA to rely on much older buses. In 1983, the average age of the bus fleet was 5.6 years. It is now 7.5 years because 515 buses that had been retired as well as some older buses in the spare fleet are now used to meet daily service requirements. Consequently, almost 30% of the buses currently in service are 12 years of age or older. (The industry standard for the useful life of buses is 12 years.) The use of these older buses threatens to increase the maintenance workload and cause a severe loss in reliability.

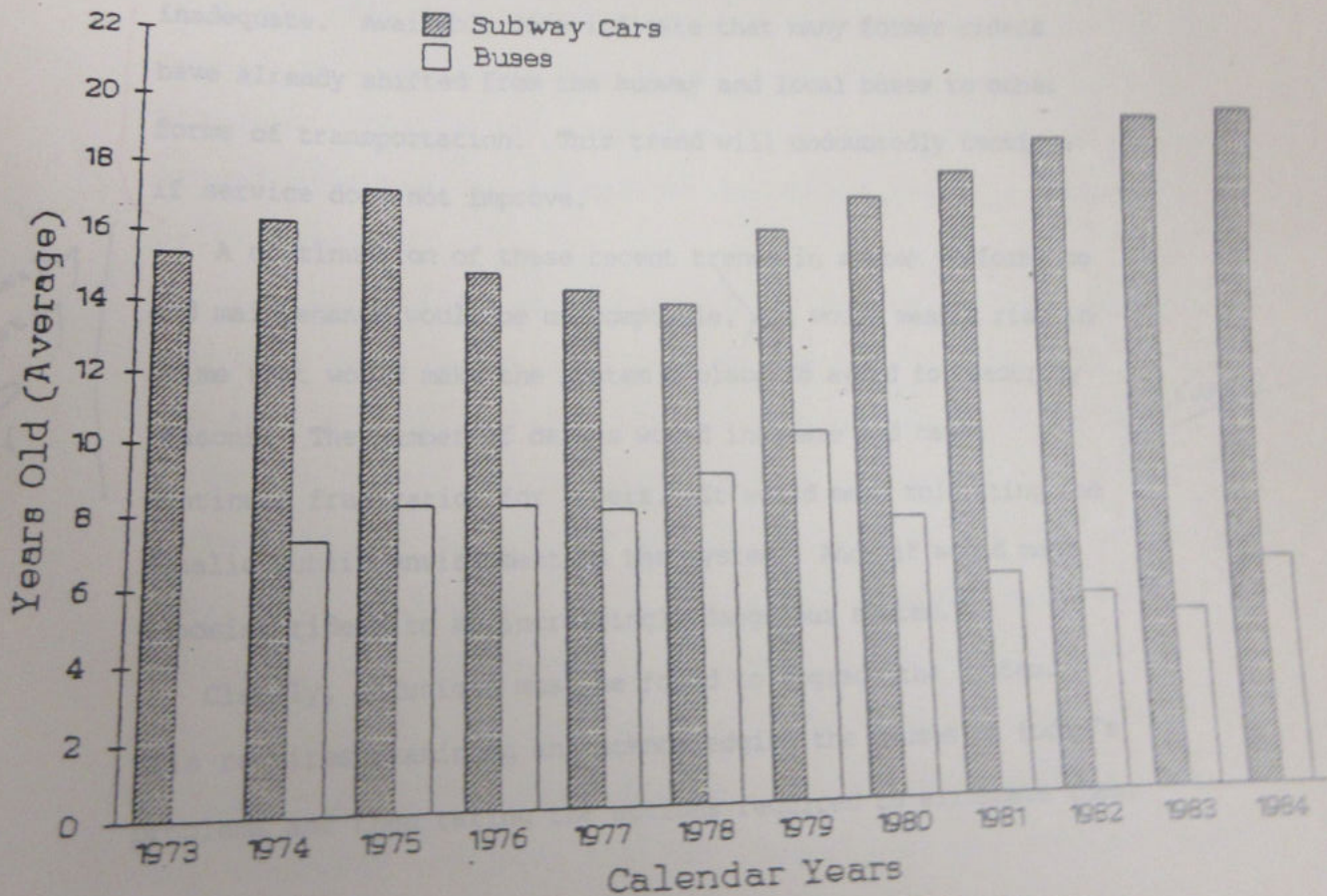
Before the retirement of the Grumman Flxible buses, 49% of the buses assigned to depots were new Grumman Flxible and GM Advanced Design Buses (ADB's) which were purchased between 1980 and 1983. The retirement of the Flxibles has eliminated the maintenance problems associated with them. However, the TA remains very dependent on ADB's since they now represent 43% of the fleet. Although the GM ADB's have not experienced the problems that the Grumman ADB's did, the buses are relatively new and have not been subjected to the test of time. They may have special maintenance needs and problems in the future. There is currently some indication that the complexity of the new ADB's increases the labor required to maintain them.

Thus, even when enough buses are added to the fleet to operate normal peak service, the TA will continue to face problems resulting from a varied fleet composed of aging and advanced design buses.

Significant?

Subway Fleet

The average age of the subway fleet has been increasing steadily since 1977. Subway cars are currently an average of 20 years old, greater than at any time in the last 11 years.



Age is not the only measure of the quality of the fleet. For example, the generation of cars purchased in the mid-1970s were technologically advanced but were plagued with many mechanical problems. As a result of that experience, the Transit Authority chose to purchase new R-62 cars that are essentially the same as 40 year old cars rather than finding a more appropriate technological balance.

C. Conclusion

The transit service presented to the public and the condition of the infrastructure behind the service has declined markedly in recent years and can only be assessed as inadequate. Available data indicate that many former riders have already shifted from the subway and local buses to other forms of transportation. This trend will undoubtedly continue if service does not improve.

A continuation of these recent trends in system performance and maintenance would be unacceptable. It would mean a rise in crime that would make the system a place to avoid for security reasons. The number of delays would increase and cause continued frustration for riders. It would mean tolerating the squalid public environment on the system. And, it would mean exposing riders to an increasingly dangerous system.

Clearly, solutions must be found to upgrade the system. This requires examining and acknowledging the causes of today's problems and then taking the actions required to eliminate them.

Security
transit

Appendix

II. Reasons for Current Problems

A number of factors have contributed to the decline in service. Chronic underinvestment in the Authority's capital assets during the 1970s was one of the most important reasons. As a result of underinvestment in the TA's rolling stock, the average age of the bus and subway car fleets increased. Problems with the fleets have been compounded because the new subway cars and buses have been plagued with mechanical problems. Due to the underinvestment in the TA's system, the amount of subway rail replaced and track reconstructed fell below standard.

The situation was aggravated by inadequate maintenance of the TA's cars, buses, and infrastructure. In the late 1970s, the size and skill level of the maintenance staff declined while the demand for maintenance was increasing due to the increasing age of the bus and subway fleets and the increasing complexity of the new cars and buses. Recent returns to maintenance staff levels equivalent to the early 70's, unfortunately, have not improved performance. Inspections and overhauls were not conducted at appropriate intervals until very recently and even now the adequacy of the work performed is questionable.

The Authority's managerial structure could not respond to the demands of properly operating and maintaining the system under these circumstances. This is partly because Civil Service and union constraints provide a framework that is

inherently non-managerial; only a very small number of top managers can, in fact, be held accountable for their performance. Other factors that have limited management's ability to operate and maintain the system are described in detail below.

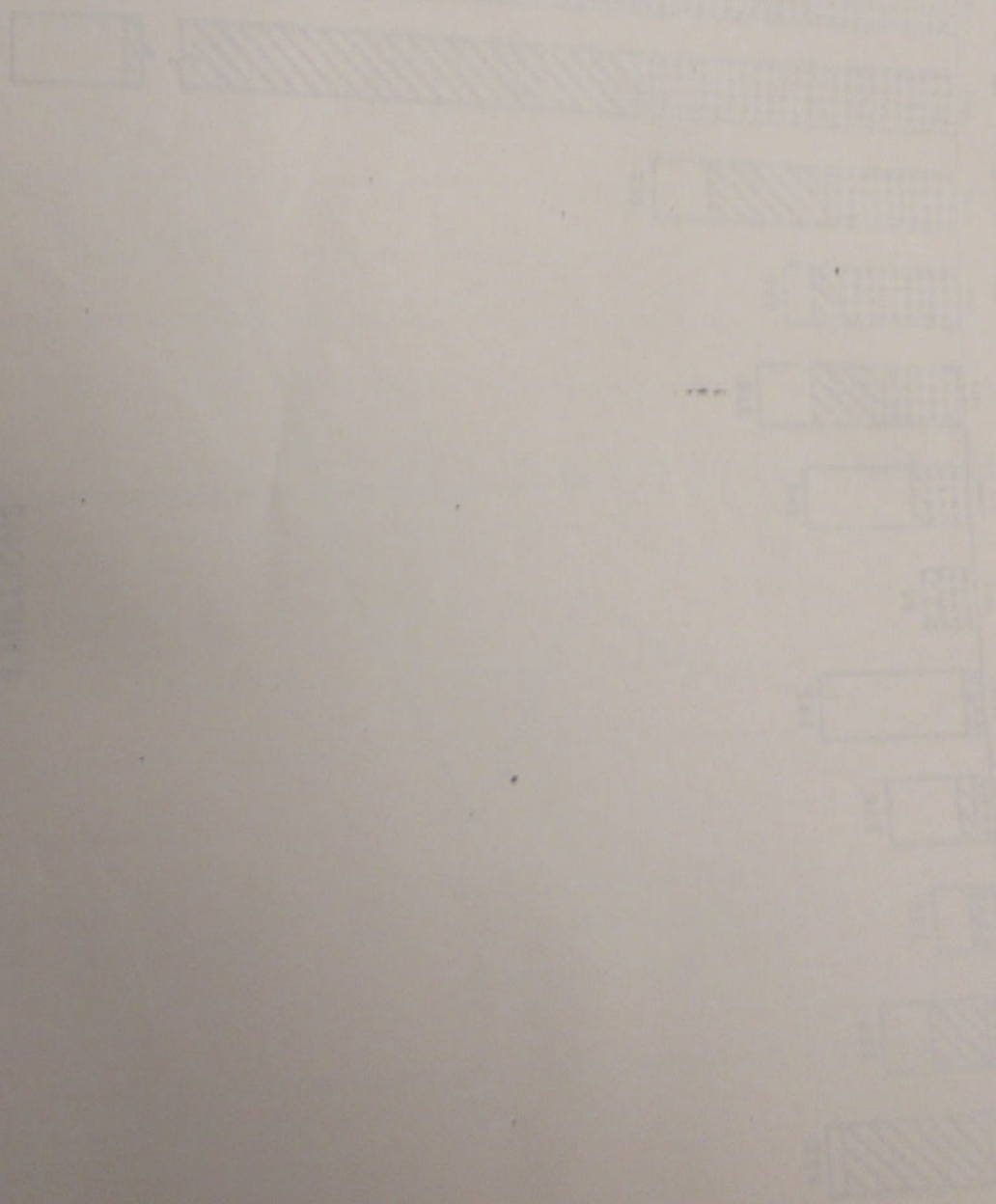
A. Underinvestment in Capital Plant

The amount of investment required to maintain the bus and subway system in a state of good repair is estimated to be roughly \$8 billion (1984 dollars) over ten years. In the ten years from 1972 to 1981, however, only \$3.0 billion (in 1984 dollars) was spent to replace or rehabilitate aging subway cars, buses, maintenance facilities, and infrastructure, so the actual investment during these years was clearly inadequate. As a result, the Transit Authority must now spend much more than \$4 billion every five years to repair the damage done by years of neglect. Under the 1982-1986 Five Year Capital Program the Authority plans to spend \$6.6 billion (1984 dollars) to halt the deterioration and begin to return the TA's system to a state of good repair. In the seven years between 1987 and 1993, an additional \$8.3 billion (1984 dollars) must be invested before most of the system is returned to an acceptable level of repair. After 1993, the required annual capital investments should decline. By the year 2000 the investments should stabilize at the \$8 billion required every ten years to maintain the system in good working order.

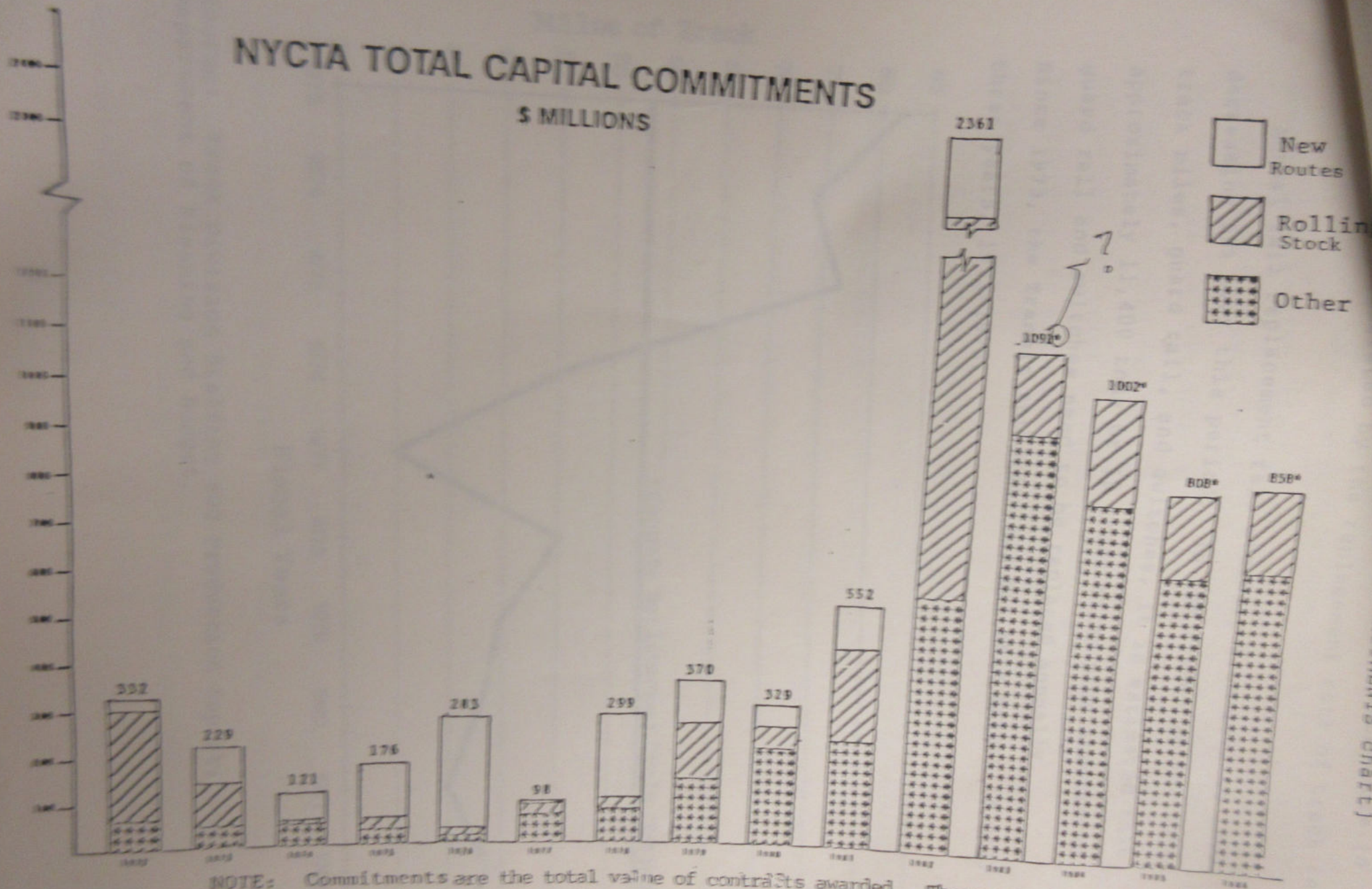
The chart on the following page compares the investments of the 1971-1982 period with the investments projected by the Five Year Capital Program. (Note: The projected investments are the amounts in the Five Year Capital Program that was approved by the MTA Capital Program Review Board, August 25, 1983.)

MTA TOTAL CAPITAL COMMITMENTS

in millions



NYCTA TOTAL CAPITAL COMMITMENTS \$ MILLIONS

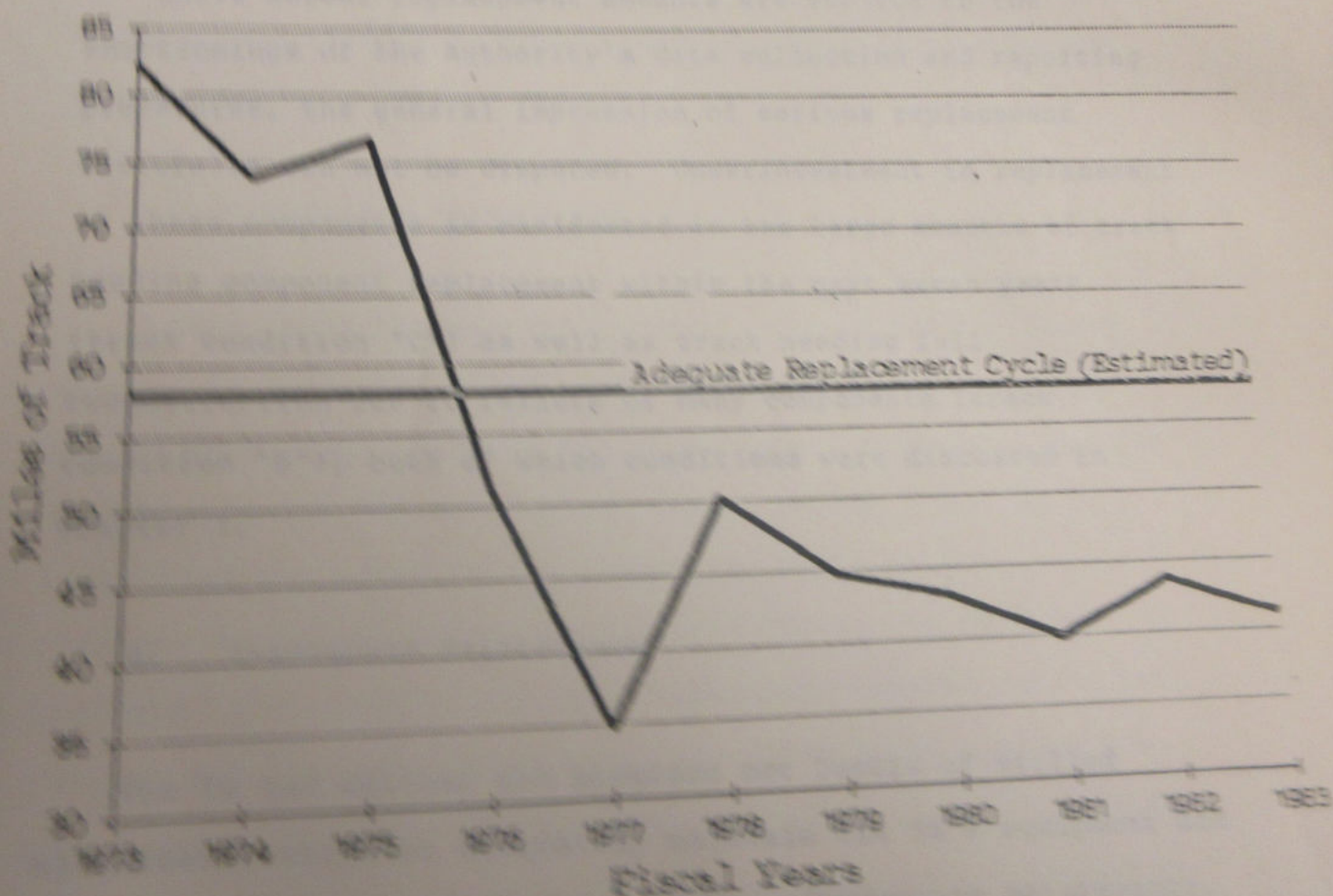


NOTE: Commitments are the total value of contracts awarded. These amounts exclude engineering costs.

Investment in the system's infrastructure is dramatically illustrated by the replacement rate of track rail.

Annual rail replacement fell steadily from 1973 to 1983, decreasing 50% over this period. In the system of 832 total track miles, guard rail, and switches, it is estimated that approximately 11,400 tons or 58 track miles plus associated guard rail and switches need to be replaced annually.

Since 1973, the Transit Authority has met this target in only three years, 1973-1975.



Source: Track Division Planning and Production Reports;
Department of Planning and Budget.

While rail is the most readily measured track component, others, such as ties, tie plates, and rail joints, must also be maintained and renewed. The annual life cycle replacement rate for ties has been estimated to be 68,090 crossties. However, an average of only 48,636 ties have been installed during each of the last six years. Similarly, only about one-third of the necessary 29,709 tie blocks (embedded in concrete) have been renewed each year.

While actual replacement amounts are subject to the shortcomings of the Authority's data collection and reporting procedures, the general impression of serious replacement shortfalls can not be disputed. Underinvestment in replacement of these components is manifested in the large amounts of track needing component replacement within the next seven years (track condition "C") as well as track needing full reconstruction due to failure of many components (track condition "D"), both of which conditions were discussed in Chapter I.

B. Inadequate Maintenance

The TA had neither the programs nor levels of skilled maintenance staff to adequately maintain the TA's equipment and infrastructure during the late 1970s. Inadequate maintenance, which contributed to the decline in service, is illustrated by the examples below on inspection and overhaul cycles and maintenance staffing.

Inspection and Overhaul Cycles

Prior to the late 1970's, data about inspections and overhauls were incomplete. During the 1970s, and possibly for years before, the Transit Authority did not place enough emphasis on these preventive maintenance activities. With the institution of the Car Overhaul Program in 1981 and the implementation of more frequent car and bus inspections in the early 1980s, the Authority has begun to reverse this trend, but a great deal of work is needed to ensure that these programs are successfully carried out.

a. Subway Car Inspections

Until 1978, inspection intervals were 7,500 and 30,000 miles. In 1978, the 7,500 mile inspection was performed at 10,000 miles and named the "B" inspection. Procedures for the 30,000 mile (or "C" inspection) remain intact. The "A" inspection was added to the inspection cycle in 1982 in response to a 1981 City Comptroller's Office report that indicated that several failures typically occurred during the initial few thousand miles after the first level inspection. Thus, the current inspection cycle of 5,000 mile ("A"), 10,000 mile ("B"), and 30,000 mile ("C") intervals was instituted at the end of 1981.

Unfortunately, data on car inspections are not available prior to 1982. The number of inspections actually conducted

the past two years closely parallels the number scheduled, but the adequacy of these inspection cycles still requires investigation.

b. Subway Car Overhauls:

Car overhaul programs are designed to complement the regular inspections through systematic replacement and repair of selected car components. Prior to 1981, the Authority did not have an overhaul program. Some overhauls were performed, but the information available does not indicate how extensive these overhauls were. Although exact numbers are not available, a small percentage of the fleet was overhauled at a level roughly comparable to the scope of the present-day "E" overhaul, which is conducted every 360,000 miles or approximately every eight years. The following table presents the total overhaul activity done by the 207th St. Shop for IRT Division cars. Data are not currently available for the Coney Island Shop which conducts overhauls for the IND and BMT Divisions. (Will add information/data to put this level of overhauls in perspective.)

Quality

Car Overhauls 1970 - 1980
207th Street Shop

<u>Year</u>	<u>Overhauls</u>
1970	154
1971	188
1972	250
1973	278
1974	257
1975	261
1976	244
1977	159
1978	212
1979	0
1980	0

Source: 207th Street overhaul records

In mid 1980 the Authority began the Car Overhaul Program, but the overhauls themselves did not begin until 1981. Under this program, overhauls are performed at the intervals shown below. (The average car travels approximately 45,000 miles per year.)

- D overhauls approximately every 180,000 miles
- E overhauls approximately every 360,000 miles
- F overhauls approximately every 720,000 miles (these will not be scheduled until the early 1990s)
- G overhauls approximately every 1,080,000 miles

The following table shows the number of overhauls completed under this program:

<u>Overhauls</u>	<u>CY 1981</u>	<u>CY 1982</u>	<u>CY 1983</u>
Level D (180,000 miles)			
IRT	76	452	377
IND/BMT	105	391	300
TOTAL	181	843	677
Level E (360,000 miles)	0	0	138
Level G (1,080,000 miles)			
In House	0	0	40
Outside Contract	0	4	104
TOTAL	0	4	144

Source: Car Overhaul Program monthly status reports.

In 1979 and 1980, there were no overhauls performed either through the Car Overhaul Program or previous programs. Furthermore, only four overhauls at the E level or greater were performed between 1979 and 1982. The absence of overhauls during that time was probably a major contributor to the decline in fleet reliability prior to 1982. Further, G overhauls have not been performed according to specification because of lack of parts. This will probably limit the future reliability of the subway fleet.

10/84
10/84
10/84

4/20/84

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c. Bus Inspections

Preventive bus maintenance also fell during the late 1970's. Between 1975 and 1982, regular 3,000 mile inspections (every four to five weeks) dropped 29%; 6,000 mile inspections dropped 9%; and 28,000 mile inspections dropped 5%. The number of 24,000 mile inspections actually increased 15%, but this evidently was not enough to offset the negative effect of decreasing the number of the other inspections.

refusing

1975	2,414	1,303
1976	2,295	1,084
1977	2,183	1,117
1978	1,984	1,176
1979	2,540	1,498
1980	2,331	1,391
1981	2,579	1,174
1982	2,790	1,338
1983	2,051	802

Source: unpublished Surface Maintenance inspection reports

Note: In June 1983 the reporting of 3,000 and 6,000 mile inspections were changed. Only 6,000 mile inspections where oil changes were performed (18,000 mile cycle) are included in 6,000 mile column. All other inspections performed at a 6,000 mile interval are listed as 3,000 mile inspections. This partly accounts for the increase in 3,000 mile inspections reported in 1983 and the reduction in 6,000 mile inspections.

Source: Surface Maintenance Department.

Why?

INSPECTIONS SCHEDULED AND COMPLETED
 (Excludes MaBSTOA Buses)

Year	3,000 mile		6,000 mile	
	Scheduled	Completed	Scheduled	Completed
1975		10,815		
1976		10,264	10,735	
1977		9,235	10,507	
1978		7,676	10,193	
1979		8,402	9,089	
1980		6,817	9,425	
1981		6,139	8,325	
1982	8,286	7,689	10,365	9,159
1983	12,120	11,582	5,217	5,052

has
 Rodents
 Seen this?

Year	24,000 mile		28,000 mile (Heavy)	
	Scheduled	Completed	Scheduled	Completed
1975		2,414		1,303
1976		2,295		1,064
1977		2,183		1,117
1978		1,984		1,176
1979		2,560		1,458
1980		2,334		1,291
1981		2,569		1,174
1982	2,790	2,769	0	1,239
1983	2,051	2,129	0	802

Source: unpublished Surface Maintenance inspection reports

Note: In June 1983 the reporting of 3,000 and 6,000 mile inspections were changed. Only 6,000 mile inspections where oil changes were performed (18,000 mile cycle) are included in 6,000 mile column. All other inspections performed at a 6,000 mile interval are listed as 3,000 mile inspections. This partly accounts for the increase in 3,000 mile inspections completed in 1983 and the reduction in 6,000 mile inspections.

Source: Surface Maintenance Department.

ii. Maintenance Workforce

a. Reduced Workforce Size

In an effort to reduce expenditures without visibly sacrificing service, the Transit Authority cut back on its maintenance workforce during the late 1970s. Many of the problems the Transit Authority is experiencing today are a result of this policy of deferred maintenance of vehicles and infrastructure.

For example, while total hours worked by all Authority workers fell 12.3% between 1973 and 1979, the hours worked by the employees responsible for maintaining the Transit Authority's subway cars (the Car Maintenance Department) fell 33%, nearly three times the overall rate. The number of Car Maintenance hours has now reached the 1973 level once again* but that cannot undo the effect of many years of inadequate maintenance.

While the maintenance of the subway cars was declining, the amount of service provided and thus the need for maintenance did not decline nearly as much.* The number of hours worked by Transit Authority employees who directly serve the subway-riding public -- train operators, conductors, and token booth clerks (in the Rapid Transit Transportation and Station Departments) -- fell 13% over this period, the same as the overall TA decrease.

The number of hours worked by those responsible for maintaining the bus fleet (the Surface Maintenance Department) fell 16% from 1973 to 1977, while the hours worked by bus

*Current workforce levels compared to fleet size will be

ers fell only 5% over this period. Again, the amount of maintenance performed fell much more than the need for maintenance (as measured by hours of service). However, the illusion of keeping the service up can last for only a short time.

Hours Worked by Employees*
(000's)

FY	Total**	R.T. Transp. and Stations	Surface Transp.	Maint. of Way	Car Maint.	Surface Maint.
1973	72,149	24,062	20,274	11,790	9,829	6,194
1974	71,371	23,772	20,388	11,768	9,414	6,082
1975	70,663	23,653	20,179	11,831	8,997	6,003
1976	66,598	22,549	19,404	11,231	8,024	5,391
1977	64,253	21,647	19,320	10,573	7,498	5,215
1978	62,318	21,138	18,365	10,387	6,949	5,479
1979	63,284	21,206	18,355	10,580	6,627	6,517
1980	62,808	20,916	18,093	10,325	6,985	6,489
1981	67,647	22,103	18,777	10,849	8,966	6,953
1982	67,985	22,248	18,569	10,983	9,706	6,479
1983	68,614	22,264	18,510	11,387	9,893	6,560

* Includes employees paid by the hour ("hourly" employees) only.

** This column is the total of the other five columns and is virtually all (98%) of the total hours worked by "hourly" employees.

Source: Monthly Pay Hour Report, Transit Authority Accounting Department.

So what's wrong?
Revenue miles
down - CUTS =
Service cuts??
less vehicles =
same #
more hours?
Also
no.
Revenue

Lack of Skilled, Experienced Maintenance Staff

Over the past fifteen years, the disparity has increased between the technical skill base of maintainers and the complexity of the maintenance tasks facing the Authority. Factors that contributed to this decline included high attrition in 1969 and 1970, a lower skill level in the pool of recruits, more complex maintenance tasks, and reduced training.

1. Attrition Rates

In 1969 and 1970, following the implementation of the 20 year retirement plan, the Authority experienced a high rate of retirements in a number of critical operating skill areas, with the result that a large portion of the labor force in these areas were relatively new and inexperienced. The following table shows the number of people leaving four technical titles (for whatever reason) as a percentage of the total number of people in the title:

ATTRITION RATES

<u>FISCAL YEAR</u>	<u>Bus Main- tainer 'B'1</u>	<u>Car Main- tainer 'E'2</u>	<u>Track- worker</u>	<u>Structure Maintainer 'D'3</u>
1969	16%	28%	26%	22%
1970	19%	21%	21%	8%
1971	17%	12%	13%	11%
1972	11%	3%	7%	8%
1973	8%	4%	9%	6%
1974	6%	4%	8%	8%
1975	6%	4%	5%	18%
1976	3%	3%	5%	11%
1977	6%	5%	7%	4%
1978	8%	4%	5%	7%
1979	7%	6%	4%	9%
1980	9%	10%	6%	9%
1981	10%	7%	9%	6%
1982	8%	5%	7%	7%
1983	11%	7%	7%	11%

- 1 Mechanical Bus Maintainer performs engine maintenance.
- 2 Electrical Car Maintainer performs electrical work.
- 3 Sheet Metal Worker

2. Pool of Skilled Recruits

Although there are no specific data on the point, there is a widespread perception that skill levels relative to previous periods declined as retirees were replaced by new recruits in the early 1970s. Not only did these recruits not have the on-the-job experience of the retirees, but the skill level of the pool of available employees seemed to be declining. For one thing, fewer candidates had the experience of mechanical work in military service; for another, manufacturing jobs in New York, which are the jobs that require skills similar to those useful to the Authority, declined markedly, which may also have caused a drop in the number of New Yorkers having those skills. The number of manufacturing jobs in New York City has declined from over a million in 1950 to roughly 430,000 in 1983.

Because the Authority was not able to attract sufficient numbers of skilled personnel in certain areas, it was compelled to relax the requirements for some technical positions. The minimum experience requirement for certain Car Maintainers was reduced from four years to 2 1/2 years (or two years with the appropriate education) in March 1982. This relaxation in requirements, which is still in effect, affected two other titles, Road Car Inspector and Car Inspector, since personnel for these titles are hired from among those qualified as Car Maintainers. The following table shows the number of personnel hired in these three titles since the change in the minimum experience requirement took effect:

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	<u>Car Main- tainer E</u>	<u>Road Car Inspector</u>	<u>Car Inspector</u>	<u>Total</u>
No. hired between 5/82. and 10/83.	194	116	147	457
Total Personnel in Title	982	199	1,653	2,834
New Lines as a Percent of total	20%	58%	9%	16%

only
POM's
but not
the

The net result is that in one title, Road Car Inspector, over half the personnel performing this function may have been hired since the requirements were relaxed. Promotions are made from this labor pool so whatever skill inadequacies are not addressed in these titles are carried up into the supervisory positions.

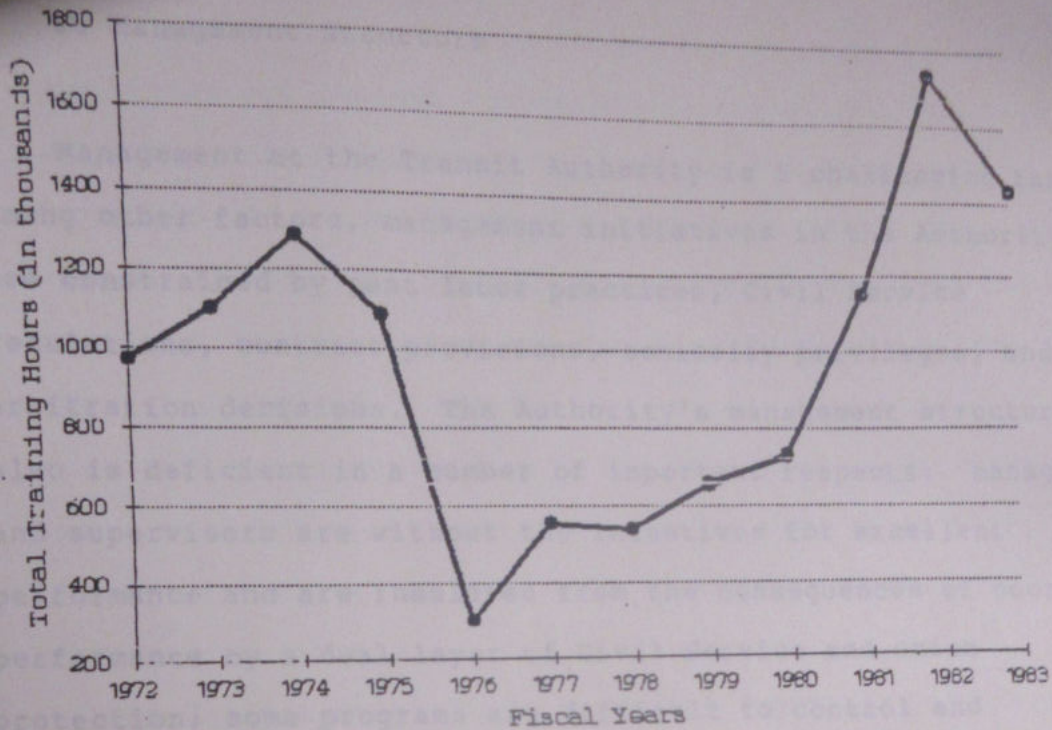
3. More Complex Maintenance Tasks

During the 1970s, the complexity of the tasks performed by both Car Maintenance and Surface Maintenance increased for two reasons. First, the acquisition of the R44 and R46 classes of subway cars and the Advanced Design buses increased the complexity of the equipment being maintained. More sophisticated circuitry and the addition of new equipment including air pollution control devices and wheelchair lifts are the reasons. Second, as the remainder of the fleet aged, the ratio of unscheduled work to routine maintenance grew, creating additional requirements for maintenance workers skilled in diagnostic work.

4. Reduced Training

In the mid 1970s, total training hours conducted by the Transit Authority employees declined 77% from a high experienced in 1974. Training for employees in Car Maintenance, Maintenance of Way, and Power declined 68% from 1974 to 1976 before being fully restored in 1983.

*Important
Point
Expanded*



Source: As reported by the operating departments
and compiled by Management Development

C. Management Structure

Management at the Transit Authority is a challenging task. Among other factors, management initiatives in the Authority are constrained by past labor practices, Civil Service regulations, contract provisions, seniority privileges, and arbitration decisions. The Authority's management structure also is deficient in a number of important respects: managers and supervisors are without the incentives for excellent performance and are insulated from the consequences of poor performance by a dual layer of Civil Service and union protection; some programs are difficult to control and coordinate due to increased reliance on outside consultants; line managers have insufficient access to engineering and analytical support; and administrative systems also fail in some cases to support operations and decision making. As a result of these deficiencies in the management structure, many operating and maintenance problems are not identified and addressed and operating plans are often difficult to formulate and implement.

1. Managerial Accountability

The ability of the Transit Authority to significantly improve operations is hampered by the current management structure. Under existing Civil Service regulations and Union representation, the Transit Authority has a management structure that is substantially beyond the control of top

Wising

management. Managers and supervisors earn their jobs not by appointment but through competitive examinations, have their jobs secured by Civil Service, and have their pay rates determined not by performance but by Union membership. Since managers are seldom rewarded for performing well and not held to account for performing poorly, many managers and supervisors simply "do their job" and fail to achieve potential productivity improvements from the employees reporting to them. This has contributed to past failures to achieve productivity gains and continues to hamper current efforts to improve productivity.

to = 50%
emphasis

The Transit Authority's operating departments have 5,115 managers and supervisors responsible for the management of 41,466 operating employees. Of these managers and supervisors, only 274 are appointed by top management, are paid on the basis of performance evaluations, and can be removed from their positions if their performance does not meet top management's standards.

to = 50%
emphasis
20713 34

The remaining 4,841 first, second, and third level supervisors are not appointed by top management on the basis of their performance but attain their positions by passing Civil Service exams. Also, these supervisors are not paid on the basis of their performance but on the basis of collective bargaining agreements. These two factors have created a situation in which the personnel that management counts on for the implementation of its initiatives are much closer in outlook to the point of view of labor than to management.

A closer look at the Maintenance of Way Department, for example, shows that only 15 appointed managers are responsible for the management of over 1000 supervisory employees who in turn are responsible for the management of over 6000 hourly employees. The managerial problems to be encountered are exacerbated by the dispersed nature of MoW's operations.

MAINTENANCE OF WAY
LINE FUNCTIONS

SECTION	HOURLY	SUPERVISORS	MANAGERS
Line Equipment	759	121	2
Power	1127	232	4
Signals	1130	145	2
Structures	1414	260	2
Track	1687	289	2
Total	6117	1047	15

In the Car Equipment Department, where, with the exception of certain Road Car Inspectors, all hourly employees work in fixed locations, seven managers are responsible for 421 supervisors who in turn are responsible for 4026 hourly employees.

2 Compensation System

Some of the same restrictions that constrain senior Transit Authority managers from motivating middle management also constrain first and second line supervisors from motivating hourly employees. Middle managers in line departments are unable to offer rewards and incentives to their subordinates since compensation is determined by contract, promotion is largely determined by examination, and work assignments for hourly employees are a function of seniority.

Because of middle management's inability to reward performance consistent with the achievement of its goals, productivity at the Authority is low. For example, a study of the Unit Repair Sections of the Main Rapid Transit Shops concluded that output was far lower than would be achievable under rigorous standards and controls. A companion study of the Unit Repair Sections of the Main Surface Shops came to similar conclusions. Not only does the existing system preclude management from rewarding a good performance, but the system can and, in some instances, actually does reward inefficient work practices. This occurs when relatively inefficient and ineffective employees and employee groups are "rewarded" by the availability of large amounts of overtime work.

3. Limited Technical and Analytic Support in Line Departments

A second factor that limits the efficiency and effectiveness of field operations is the concentration of analytic and technical staff in central overhead units.

Many of the Transit Authority's operations involve the maintenance of complex mechanical equipment or structures. The Authority maintains a staff of technicians, engineers and planners to design new equipment, structures, and facilities, to manage the implementation of capital projects, to investigate failure of equipment or facilities, to advise management on a variety of other technical subjects, and to analyze the costs and benefits of program proposals. However,

The following table shows the 1984 allocation of engineers within the Maintenance of Way and Car Equipment departments and the division between line and overhead units:

1984 Budgeted Positions for Engineers

Maintenance of Way

<u>Unit</u>	<u>Number</u>	<u>Percent of Total</u>
<u>Line Units</u>		
Signals	0	
Line Equipment	0	
Track	4	
Power	0	
Structures	0	
Subtotal-Line Units	4	3.1%

Overhead Units

Office of General Superintendent	0	
Engineering	101	
Quality Management	2	
Production	22	
Subtotal-Overhead Units	125	96.9%
Total-Department	129	100.0%

Car Equipment

Line Units

Operations	0	
Car Overhaul Program	23	
Subtotal-Line Units	23	26.0%

Overhead units

Assistant General Manager	1	
New Car Engineering	29	
Electrical Maintenance	1	
Quality Management	34	
Subtotal-Overhead Units	65	74.0%
Total-Department	88	100.0%

This imbalance between line and overhead units derives from the centralization of a number of technical functions. A specialist in one type of construction, for example, may have assignments in an overhead unit that pertain to operations within several line jurisdictions. While this may be efficient in some cases, the major problem with such a structure is that a line manager often does not have someone to hold accountable for technical matters. If a structure needs major repair, for example, a line manager who is responsible for maintaining it may have to utilize the services of someone in an overhead department to design the repair and carry it out. The technical specialist, who reports to a manager who supervises the work in many divisions, may not give the project the same priority that the line manager would. The result is often frustration, missed deadlines, delays, and a situation where needed technical work does not get done in a timely manner.

4. Lack of Experienced Candidates for Line Supervisory Positions

One consequence of the existing management structure and compensation system is that the more experienced hourly employees do not have an incentive to apply for promotion. This is due to the loss in seniority (i.e. priority in picking job assignments) and overtime pay that results from a promotion to a line supervisory position. As hourly employees gain experience, they also gain seniority. As they gain seniority, they are more likely to pick an attractive job, thus reducing their incentive to apply for promotion.

Deficiencies of Administrative Systems

In order to enable managers to assume responsibility for their operations and be held accountable for the results, effective administrative and management information systems are required in any organization. The Transit Authority finds itself in a rudimentary state with respect to the development of some of these systems, and management will not be as proficient as it should be until these systems are in place and reliably operating.

Some examples of the deficiencies the Transit Authority now faces follow:

a. Budget Systems. A comprehensive budget system for the Transit Authority would explicitly link production levels in each of the operating departments, e.g., the production of overhauled subway cars or the production of a mile of track, with the personnel and materials allocated to the organizational units performing the overhauls or track construction. Linkages of this kind are not now possible on a large scale in the Transit Authority. Production levels are often not planned far enough in advance to estimate the resources required with any accuracy, and budgets are frequently built on historical levels of expenditures rather than on the basis of need for particular kinds of production.

The consequence of a budget unconnected to production levels is that managers responsible for production have trouble justifying budget requests even when the need for resources are apparent to those managers. Another is that budget makers can not describe the consequences of changing resources on the Authority's performance.

The management accountability that the Authority seeks to enforce will eventually depend on making the connection between production (or other performance such as the number of bus miles operated) with the budgeted funds allocated for carrying out that function. If the resources available to a manager are inherently too few to support production goals, that manager will always fail. On the other hand, the budget process would fail if resources were inherently too great and it was therefore possible to meet performance targets with little effort. It will be a high priority to create reliable links between budgets and production levels for the three large maintenance departments. These problems are not as severe for the transportation functions -- that is for the train crews and bus drivers -- because those budgets are based on operating schedules that translate into personnel requirements in a relatively straightforward manner.

b. Purchase, Receiving, and Accounts Payable: If managers are to be held accountable for meeting production goals, then the necessary parts and supplies must be available when and where they are needed. The unavailability of the parts and supplies needed to maintain the system's cars, buses, and

structure is currently one of the reasons that maintenance schedules are not met. With well over 100,000 parts stocked as well as other materials required on an ongoing basis, the number of transactions the Authority processes is enormous. Yet the Authority's current system to coordinate the purchase and payment functions, known as the "Purchase, Receiving, and Accounts Payable" system, does not currently function smoothly.

There have been continuous difficulties with the computer purchased to handle the system and there is currently a backlog with approximately 9,000 purchase orders waiting to be processed. The result is that the parts and materials ordering is delayed. Problems with this system have delayed integration of the automated stock status system with the Purchase, Receiving, and Accounts Payable system, so the Authority is not able to take full advantage of systems designed to improve the parts and materials availability problem. With a bus fleet below the necessary size and with the need to produce approximately 5,000 subway cars in good working order for each morning rush hour, it is easy to see how important even mundane sounding systems are to the Authority. This example demonstrates that some of the basic tools needed to enforce managerial accountability remain to be developed.

c. Management Information Systems - Data which is essential to the planning and monitoring of work is often not maintained or, if it is, it is maintained manually at work sites. For example, the mileage and maintenance histories of individual cars are recorded on index cards at the barn to which they are assigned. At this time, this information is not easily

available to other barns where trouble work may be performed on cars not assigned to them or to higher levels of management who may want to analyze aggregate car maintenance statistics.

The Transit Authority has only recently acquired the automated information and control systems that are required to overcome this problem. Thus, Car Equipment and Surface Maintenance now have automated systems for recording and scheduling repair activity, but the Maintenance of Way Department is still dependent on manual record keeping. Even where automated systems are available, managers do not use them consistently or well, in part because they are not trained in systems or data management. The result is that the data from these systems can be inaccurate, and therefore an unreliable tool for production planning and control.

This situation is being addressed but basic information systems are still being developed and introduced to line managers and cannot yet, for the most part, be used for service and production planning and to support increased line operation

6. Use of Consultants

As the table below of expenditures shows, the TA has been increasing its dependence upon consultant services within both the operating and capital programs.

Consultant Expenditures (\$ millions)

Year Ending	<u>Operating</u> ^{1/}	<u>Capital</u> ^{2/}	<u>Total</u>
6/82	7.8	11.5	19.3
6/83	10.8	32.0	42.8
12/83	11.9	40.3	52.2

The Transit Authority was forced to increase its dependence on consultants because of insufficient number of technical and professional staff to carry out the many complex projects which are a part of the Capital program and an inability to recruit qualified staff in certain essential, usually technical, titles. For example, the Engineering Department, which is responsible for the conception, design, and construction of capital projects, has remained essentially the same size

1/ The operating program's expenditures on consultants include the labor and services of accountants, arbitration and hearing officers, architects, attorneys, auditors, computer systems firms, management consultants and transit industry consultants.

2/ The capital program expenditures include the labor and services of consultants hired to perform construction design, construction inspection and technical studies of specific capital components.

(about 1,100 to 1,200 employees) while the Capital Program has nearly tripled in size from about \$250 million per year in the 1970s to \$600 to \$700 million per year in the Five Year Capital Program. Thus it became necessary to hire outside consultants and engineers in order to handle the enormous number of capital projects.

The Transit Authority, however, is not prepared to coordinate and control the many activities of a large number of consultants. Unless an organizational structure is set up that will enable the TA to effectively direct, supervise, and coordinate the projects performed by consultants, Capital Program funds may be spent correcting mistakes and doing unnecessary work.

7. Lack of Managerial Action Due to Centralized Management Structure

Because of the lack of management accountability and technical support in the line departments, managerial responsibility has become highly centralized, with a reliance on formal procedures for most operating decisions and strict control of line managers and operating supervisors.

This situation has failed to provide the flexible innovative management required by Transit Authority operations over the past ten years. Centralized management can be effective in the management of relatively routine operations.

however, although the Transit Authority does have many standardized operations, its operations have recently been characterized by a high degree of unpredictability. Routine operations have been highly disrupted by the need to quickly respond to a stream of crises. A further cost of the top down, centralized, management style is that it tends to reduce the number of problems that can be dealt with effectively at one time. By concentrating decision making, the top down managerial approach unnecessarily burdens top management and underutilizes the capabilities of lower level managers in solving problems and preventing their recurrence. Furthermore, top down management tends to discourage the initiative and innovation required to improve day to day operations. The need for operational flexibility will continue during the course of the Five Year Capital Program since routine operations will continue to require flexible responses to the necessary disruptions caused by large amounts of construction activity.

D. Inability to Manage Sudden and Massive Infusions of Capital Dollars

Lack of capital funds and managerial and organizational problems have been major causes of the TA's problems in the past. Underinvestment should not, however, be a problem in the future as a result of the Transit Authority's \$6.3 billion Five Year Capital Program and the MTA's efforts to finance future capital programs to return the system to a state of good repair and then maintain it in good condition.

Unfortunately, the management and organizational problems that have prevented the TA from responding to changing circumstances in the past still remain and have hindered efforts to carry out the Capital Program. Unless these problems can be overcome quickly, the TA will not be able to effectively use the much needed dollars provided by the Capital Program.

1. The Capital Program

The existing Capital Program provides \$6.3 billion for the period 1982 through 1986, or four times (in 1984 dollars) the annual average investment (other than new routes) during the previous ten year period, 1972 to 1981. This program begins to improve the poor conditions of the Transit Authority's service and system which were discussed in Chapter I. More specifically, the Capital Program includes the following amounts to replace, repair, and rehabilitate the TA's aging and deteriorating car and bus fleets, maintenance facilities, and infrastructure.

- o \$1.5 billion for the procurement, testing, and acceptance of 1,375 new cars. This cost constitutes 24% of the Five Year Capital Program, making the new car purchase the largest single expenditure under the Five Year Program. The new cars will reduce the average age of the fleet to 15.7 years from the current average age of 20 years, reduce the fleet size by 5.6% through the replacement of sixty foot cars

with seventy-five foot cars, and ensure a high level of performance through the regular replacement of subway cars.

- o \$469 million to begin the overhaul and rebuilding of subway cars not being replaced by new car purchases. (This sum includes a \$98 million "Corrective Action" Program to replace defective trucks on the 754 R-46 cars.) This program will be an essential complement to the purchase of new cars to ensure service reliability during the operating life of cars.
- o \$332 million for the acquisition of 1,873 buses. Since the buses will be purchased in every year from 1984 to 1987, these new buses will also alleviate the problem of having gaps in the procurement cycle.
- o \$220 million is expected to be added to the current allocation of \$392 million between 1982 and 1986 to replace rail and/or to completely replace track bed, including ties, ballast and switches, over a major portion of its system.
- o More than \$1.1 billion for right-of-way reconstruction and replacement between 1982 and 1986, aside from track work. This includes extensive work on signals to reduce the average age of signals in the system as well as reconstruction of the portions of elevated structures with most serious concentrations of corrosion, cracking, and wear defects.

a \$272 million comprehensive improvement of subway power supply and distribution systems. Manually operated power substations will be eliminated and maintenance intensive equipment will be replaced with simpler, more reliable components.

- o ⁴³² \$449 million for modernizing car barns and shops, with nearly two-thirds allocated to the 13 barns and one-third to the two shops. The Coney Island shop will be remodeled to accommodate 75 foot cars. The 207th Street shop, which is severely deteriorated, will undergo structural, electrical, and mechanical rehabilitation and upgrading, including purchase of modern shop equipment and tools.
- o \$462 million for work at all bus depots and both repair shops. Furthermore, \$22 million of the \$51 million spent in the last ten years in depots was spent in 1981, leaving only very small amounts in the nine prior years. Not surprisingly, an analysis recently concluded that almost all of the capital expenditures programmed for depot and shop improvements between 1982 and 1986 is needed just to bring the facilities up to a reasonable standard of repair.

2. Difficulties in Executing the Capital Program

While the investments planned in the Five Year Capital Program will eventually result in substantial improvements to the current operating conditions and service, the execution of

the \$6.3 billion program is a difficult and complex task. The unprecedented volume of capital reconstruction underway and planned over the next decade is straining the capacity of the Authority to adequately manage and control the Capital Program and to continue to maintain day-to-day operations.

Despite years of deferred capital investments, the system was ill-prepared to readily translate its needs into specific projects with clear directions for designers and builders. The condition of the system was not adequately documented when the program and its projects were developed and the result has been changes in program and project definitions, shifting schedules, and uncoordinated program management in some areas. Little or no action was taken to ensure that design and construction work met the operating needs of the system and that work would achieve the expected results. The extent and complexity of maintaining operations and service while reconstructing track, structures, and facilities was not adequately recognized; insufficient preparations were made to plan and manage unavoidable disruptions and to prepare the public for the delays and diversions that will be necessary for the next several years.

As a result of these difficulties:

- o Of 394 projects currently under construction, 87 (22%) exhibit schedule delay of 2 or more months.
- o Of 19 projects scheduled for advertising in 1984, 15 (79%) are delayed for various reasons.
- o Of 28 consultant contracts (design and administration) scheduled to begin since December 31, 1983, 17 (61%) have failed to start.

Reasons for the problems include the following:

a. Lack of Information.

There is often a lack of good information about the state of repair of the system. A notable example of such a lack is the track program:

The poor condition of the tracks was not fully recognized until the summer of 1983 when the growing incidence of derailments forced the Authority to institute slow orders across the system until emergency (red-tag) track conditions were addressed. The deterioration of the track system was subsequently confirmed by track condition surveys completed during the latter half of 1983. These surveys concluded that over 300 miles of mainline track would require reconstruction or replacement within seven years.

Given this new information, it was clear that the \$392 million originally allocated for the track program was insufficient. The Transit Authority expects to commit an additional \$220 million to expand the track program.

This track program is very ambitious. Of the 836 Authority employees to be devoted to track reconstruction, 384 will be new employees. Thus, fully 46% of this work force will be new to their tasks and, in fact, will perform tasks not undertaken on such a scale in the recent history of the Authority. Undoubtedly, the Authority will encounter many problems as it undertakes this effort and, consequently, the previously stated program goals may not be achieved. Even though the TA's clearer understanding of the condition of the track system will permit the setting of goals which more properly reflect the

TA's needs, there still remains sufficient uncertainty about the extent of track deterioration to warrant bringing in Federal track inspectors from the Federal Railroad Administration to evaluate the condition of the Authority's track.

b. Lack of comprehensive program plans, detailed project scopes, and cost definitions.

The Authority is often handicapped by incomplete planning and detailing of capital projects. An example is the revitalization of shops and barns:

Even though the Five Year Capital Program allocated \$468 432 million for rehabilitation of barns and shops, no master plan existed to integrate system and facility needs in a coordinated fashion. Consequently, project scopes and accompanying cost estimates were only loosely defined. The development of a master plan, and further refinement of specific project needs, became the primary engineering task once the program began. As a result, actual construction work was shifted to a later and more compressed time frame. This ongoing definition of work scopes has resulted in an increase in budgeted cost estimates of more than \$40 million. Two of the more difficult problems still to be resolved include the mechanical systems for "blow out" (heavy cleaning) equipment in the barns and the configuration of the areas in the main shops in which the undercar assemblies (trucks) of subway cars are repaired. Another serious matter that requires resolution is the scheduling of rehabilitative and maintenance work on subway cars at barns and shops while 14 of the 15 barns and shops are under construction simultaneously.

The complexity of executing the barn and shop capital program as scheduled is more understandable when compared to historical investment levels. The investment planned for construction award between 1982 and 1986 is, in real terms, more than twice the investments made in barns and shops over the previous ten years. Moreover, this increased level of investment is planned to occur while carrying out large new overhaul programs on the cars.

c. Inadequate program and project definition and insufficient funding allocations.

A number of factors have already caused the bus depot capital program to fall short of its original goals and schedules. Such factors include:

- Delays in the construction of the Gun Hill depot and shop because of environmental regulations and community opposition to the depot;

- Delays in the reconstruction of the 132nd Street depot following receipt of contract bids far in excess of cost estimates and budgets; and

- Initial budget allocations for rehabilitative work at bus depots have been consistently (and substantially) below actual facility needs.

As a result of these problems, there have been substantial revisions to the depot rehabilitation program even as the Five Year Program enters its third year. Specific examples include:

- A 170% increase in the estimated cost of the Group One Depot Modernizations (including Castleton, 146th Street, Amsterdam, and 126th Street depots) stemming from a thorough review of conditions at these facilities;
- A 165% increase in the estimated cost of the Group Two Depot Rehabilitations (including Flatbush, Ulmer Park, Fresh Pond, and Queens Village depots), again stemming from a more thorough investigation of actual needs at these facilities; and
- A quadrupling of the estimated cost of rehabilitating the 54th Street depot.

d. Lack of coordination throughout the project

A project progresses through various phases before it reaches completion. Because the Transit Authority does not assign one project manager to be responsible for the project throughout its life, there are often problems coordinating the various phases of the project and making it relevant to the operating needs of the system.

An example is the purchase of the new subway cars. The 1375 new cars are scheduled for delivery as soon as the test cars pass performance tests, but the Authority's readiness to accept, test, protect, and maintain these cars is not yet established. Specific problems confronting this important program include the following:

- Delivery of the first 325 subway cars (to be received under the R62 contract) has already fallen behind schedule due to problems with the first test cars received under this contract.

- It may prove difficult for the Authority to accept and test the new cars at the currently planned rate. Upon delivery, the new subway cars should undergo comprehensive acceptance and equipment testing procedures. The volume of new cars expected to be delivered and the pace of that delivery may exceed the capacity of the Authority to accept these cars, both in terms of the capacity of Authority personnel to carry out the necessary procedures and in terms of sufficient yard capacity to store the new cars during the acceptance and testing period. These capacity problems may be particularly severe if delays in the new car delivery schedule result in an accelerated delivery pace once the 30-day test is completed satisfactorily.

- New car inspection, maintenance and protection procedures and plans are currently inadequate to ensure that the new car fleet will be clean and reliable. Specifically, plans must be developed to ensure: proper inspection and maintenance procedures, including adequate training for inspection and maintenance personnel; adequate maintenance facilities to inspect and repair the new cars; secure overnight yard storage to protect the new car fleet; and proper and adequate cleaning procedures to maintain the interior and exterior of the new cars.

While the new cars will be a substantial improvement over the cars being retired, there are many factors -- outlined above -- that could result in slipped delivery and acceptance schedules. Unless the Authority properly plans and manages the inspection, maintenance and protection of the new cars, the full benefit of this very large investment may not be realized for some time. Notably, recent projections of new car reliability were based only on rough expectations, not on actual measurements of the performance of the new cars. The performance of the new cars may be disappointing --especially in the short term. The Authority's recent experience with the performance of new rolling stock -- buses and subways -- has not been good. Efforts have been made to prevent the problems of the past but expectations with regards to new car performance may not be met.

e. Inability to adhere to schedules and attain program goals and objectives.

The Car Overhaul program is an example of the difficulties the Authority faces when implementing a major new program:

The Car Overhaul Program was initiated in 1980 in an effort to revive an unreliable and poorly maintained subway car fleet. The program has suffered from a chronic inability to meet its production schedules and goals.

The following table shows how the Car Overhaul Program failed to meet its overly optimistic goals according to the schedules and how the schedules themselves have changed. In fact, in most cases, by the end of 1983 overhauls came close to or exceeded schedules only because the scheduled overhauls had been drastically reduced (but even these numbers are deceptive because the overhauls could not be finished for lack of parts):

Source: Car Overhaul Status reports

D Level Overhauls

Goal for	1982	1983	1983
As of	5/6/82	1/1/83	7/1/83
Scheduled	868	1131	488
Actual	681	677	677
Completed as			
% of Scheduled	78%	60%	139%

E Level Overhauls

Goal for	1982	1983	1983
As of	10/8/82	1/1/83	7/1/83
Scheduled	20	237	143
Actual	0	138	138
Completed as			
% of Scheduled	0%	58%	97%

G Level Overhauls

Goal for	CY1982	CY1983	CY1983
As of	5/1/82	1/1/83	7/1/83
Scheduled	29	266	120
Actual	4	144	144
Completed as			
% of Scheduled	14%	54%	120%

Source: Car Overhaul Status reports

Personnel Availability: In some cases, space and materials were ready but the work force was not available. Until the second half of 1983, COP incumbents continued to be substantially below planned levels.

Barn and Shop Space: The Car Overhaul Program has had to compete with other car maintenance operations for limited shop and barn space.

The overhaul program has encountered, and failed to adequately overcome, problems in four critical areas.

- Material Planning and Delivery: Some needed materials were not identified early enough or ordered in sufficient quantities to meet scheduled demand and material delivery time was often underestimated. As a result of this plus breakdowns in the procurement system, at least 20-30% of the required parts to be replaced have not been replaced in overhauls reported as "completed".

- Staffing: The lead time necessary to negotiate with the labor unions to establish manning levels on car overhaul projects has, in the past, been underestimated.

- Personnel Availability: In some cases, space and materials were ready but the work force was not available. Until the second half of 1983, COP incumbents continued to be substantially below planned levels.

- Barn and Shop Space: The Car Overhaul Program has had to compete with other car maintenance operations for limited shop and barn space.

COP management is currently in the process of reassessing and revising all schedules to realistically reflect what can be accomplished, given material, staffing, and space problems.

The Car Overhaul Program also contains many special projects specific to car classes and car components. The schedules have been met more consistently for these projects and there has not been such drastic schedule changes within one year as with the D,E and G overhauls. However, in some high volume areas, schedules are still not being met consistently.

These several examples demonstrate the fact that considerable work remains to be done if our riders are to gain the full benefits from the large investments now being made. Program and project definition must be improved, management responsibility established for specific projects, and accountability fixed for achieving programmatic and financial results.

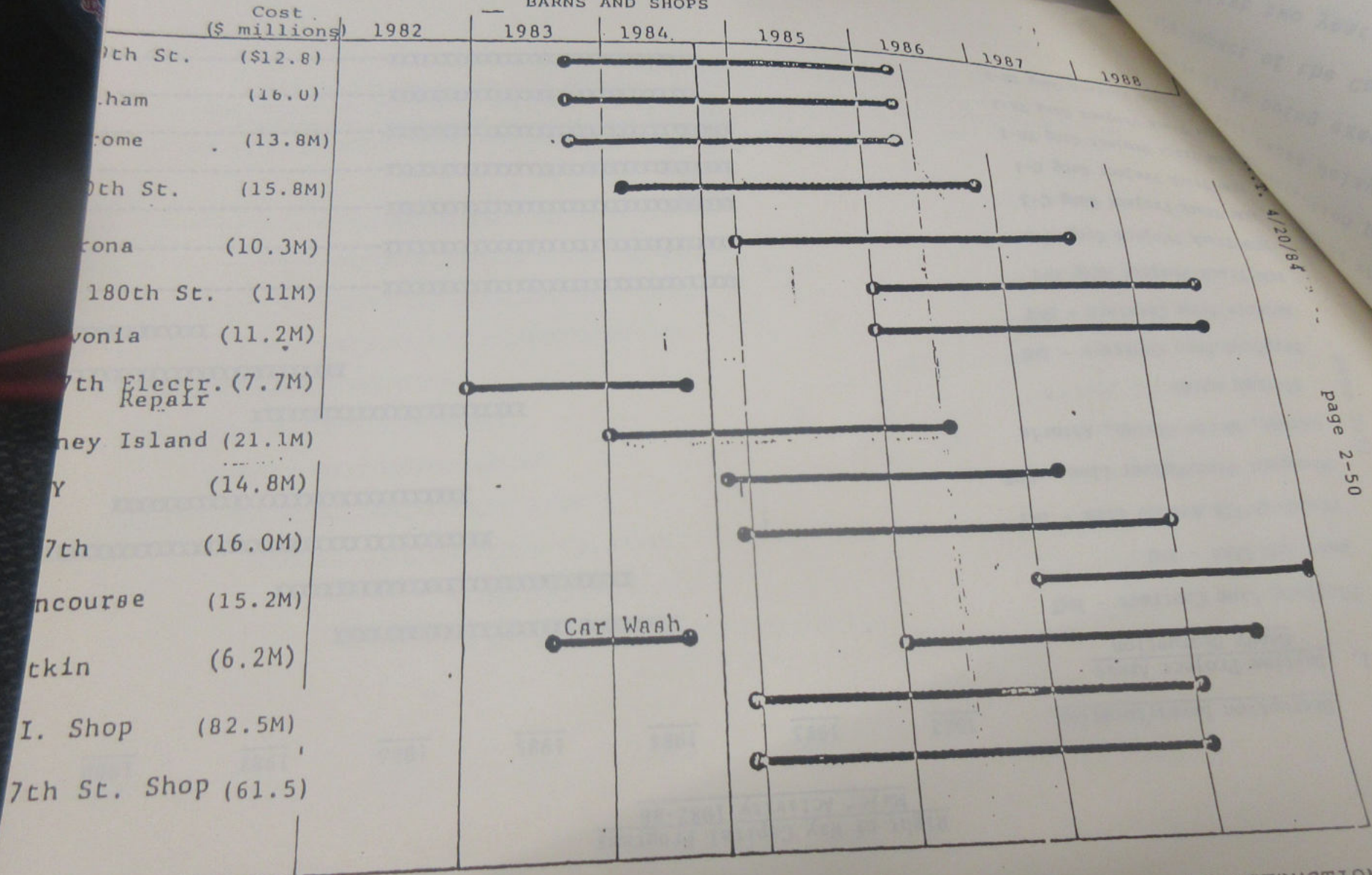
f. Benefits of the Capital Program are not Close at Hand.

There is no assurance that service will not decline further before the benefits of the Capital Program are realized. The deterioration of the system is extensive: half the track needs replacement or rail renewal, half the signals are beyond their estimated useful life, and one-fourth of the spans on elevated structures have serious visible defects. In addition, the service improvements expected to begin this year from new IRT R62 cars will be delayed somewhat by the acceptance procedure which assures that the cars are reliable. In the meantime, the existing fleet continues to age.

The integration of the much-needed but massively intrusive capital reconstruction program into a 24-hour operating transit system will cause delays, diversions, and service interruptions while it is being executed. As shown in the following charts, the impact of the Capital Program was largely unnoticeable in its first two years, 1982 and 1983, when projects were under design and equipment was on order. In 1984, the impact will be disruption to operations and service due to reconstruction on the right-of-way and at maintenance barns, shops, and depots. Not until 1987 will passengers experience more reliable service from the extensive barn, shop, and depot modernization now underway.

Reconstruction and rehabilitation of the right-of-way will cause heavy disruption to daytime subway service starting this year and possibly for several years to come. Night time disruptions are currently going on and will also probably continue for several years. Rehabilitation of bus depots will cause dislocations throughout the City in meeting schedule requirements and properly maintaining the buses. The depot rehabilitations will be particularly disruptive in 1985 when work is underway at half the depots. Operation out of rehabilitated or new depots will not begin until 1986 and 1987. Similiar dislocations to subway car maintenance and management of cars for service will continue well into 1987.

CONSTRUCTION SCHEDULE OF BARNES AND SHOPS



4/20/84

page 2-50

te: Costs shown are for construction.

Schedule dates estimated as of Jan. 1, 1984.

CONSTRUCTION

Right of Way Capital Programs
Major Activity 1982-88

<u>Disruption Level/Location</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
1. <u>Daytime Project Areas</u> <u>Heavy Disruption</u>							
Flushing Line Contract - BMT				XXXXXXXXXXXXXXXXXXXXXXXXXXXX			
West End Line - BMT				XXXXXXXXXXXXXXXXXXXXXXXXXXXX			
Broadway/7th Avenue Line - IRT					XXXXXXXXXXXXXXXXXXXXXXXXXXXX		
Prospect Park/Culver Line - BMT					XXXXXXXXXXXXXXXXXXXXXXXXXXXX		
Jerome, White Plains, Astoria through spans					XXXXXXXXXXXXXXXXXXXXXXXXXXXX		
Brighton Zone Contract - BMT						XXXXXXXXXXXXXXXXXXXXXXXXXXXX	
Astoria Zone Contract - BMT							XXXXXXXXXXXX
MOW Track Project Gang C-1				XXXXXXXXXXXXXXXXXXXXXXXXXXXX			
MOW Track Project Gang C-2				XXXXXXXXXXXXXXXXXXXXXXXXXXXX			
MOW Track Project Gang C-3				XXXXXXXXXXXXXXXXXXXXXXXXXXXX			
MOW Track Project Gang C-4				XXXXXXXXXXXXXXXXXXXXXXXXXXXX			
MOW Track Project Gang TR-1				XXXXXXXXXXXXXXXXXXXXXXXXXXXX			
MOW Track Project Gang TR-2				XXXXXXXXXXXXXXXXXXXXXXXXXXXX			
MOW Track Project Gang TR-3				XXXXXXXXXXXXXXXXXXXXXXXXXXXX			

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Right of Way Capital Programs
Major Activity 1982-88

<u>Disruption Level/Location</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
2. <u>Night Project Areas</u> <u>Heavy Disruption</u>							
Zone I - Brooklyn IRT							
6th Avenue Track Rehab - IND							
Zone II - 4th Avenue BMT							
Zone III - 8th Avenue IND							
Lexington Avenue Line Contract - IRT							
Bronx Concourse Line - IND							
Broadway/7th Avenue Line Contract - IRT							
MOW Track Project Gang - C-5							
MOW Track Project Gang - RP-1							
MOW Track Project Gang - TR-4							
MOW Track Project Gang - TR-5							

Note: Heavy disruptions to service occur in project areas that include signal work, track rehabilitation or through span rehabilitation. In those areas long term diversions of service may be necessary primarily during restricted hours (Days 10-3, nights 12-5). Moderate diversions to service occur in project areas that includes equipment replacement or structural work other than through span rehabilitation which will only require short diversions of service.

Right of Way Capital Programs
Major Activity 1982-88

<u>Disruption Level/Location</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
3. <u>Daytime Project Areas</u> <u>Moderate Disruption</u>							
Zone I - Brooklyn IRT							
Broadway/Jamaica & Myrtle Lines - BMT							
Jerome Avenue Line Contract - IRT							
White Plains Road Line Contract - IRT							
4. <u>Night Project Areas</u> <u>Moderate Disruption</u>							
Canarsie Line Contract - BMT							
Queens Blvd. Line - IND							
Cranberry Tube Line Contract - IND							

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11. Solutions

This chapter describes the actions that will be taken to overcome the significant obstacles that stand in the way of smooth implementation of programs to combat the deterioration that plagues New York's bus and subway service.

The general solutions to the problems of the Authority's current condition are threefold: to set up a management structure that establishes accountability and gives managers the means to carry out assigned responsibilities; to make changes to ensure that capital investments are effectively used to restore plant and equipment to a state of good repair; and to ensure that operating and maintenance programs are performed well and on schedule.

The process of setting goals will be an important step in the Authority's plan to restore the transit system to good working order. To be a meaningful process, however, it is essential that the goals be set by the people who are ultimately responsible for achieving those goals. Until a management structure is in place that promotes accountability, and that has supervisors and managers in place who can be rewarded for successes and penalized for failures, the goal setting process will lack meaning since little commitment to achievement can be expected.

The Authority's managers also need the information and analytic and technical support to develop budgets, establish production goals, and plan work. For the immediate future, goal setting will be focused on production units to be sure that the most obvious measurable needs are met.

Strong, clear, confident management at every level is one key to the effective utilization of the Authority's workforce and the development of productive and effective work practices. To achieve this goal, it is essential that the Transit Authority make managers accountable for the service or work produced in their areas of responsibility and that they be given the means to carry out their responsibilities.

Currently, neither condition is met. None of the Authority's planned capital or operating programs will set the Authority on a sustainable upward course without a drastic change in the way management is organized.

1. Managerial Accountability

To establish the conditions necessary to achieve managerial accountability, the Authority intends to:

- o upgrade skills of managers through training, development, and recruiting;
- o give managers the labor, materials, and analytic, technical, and information support they need to plan and carry out their work;
- o give managers and supervisors the authority and responsibility to establish goals and objectives for production and performance at many levels, from the Authority as a whole to individual shops;
- o give managers the authority to reorient budgets to meet goals;

- o allow managers and supervisors to recognize differences in performance in decisions about compensation and promotion; and
- o monitor and appropriately reward the performance of supervisors and managers in planning and achieving goals and objectives for their areas of responsibility.

By holding all employees in supervisory or managerial positions responsible for the performance of their units, the Transit Authority hopes to realize the significant productivity gains that the elimination of work quotas and work rules promise. This will effectively provide an increase in the resources allocated to maintenance, repair, and cleaning activities that are necessary to provide decent transit service.

To achieve this goal, the management of the MTA has proposed a three-part management reform program to:

- a. "broadband" first and second level supervisors within a department;
- b. reclassify the third and fourth level supervisory titles to non-competitive managerial titles; and
- c. eliminate union representation for all supervisors and managers above the second level. There are generally four levels of supervision.

The "broadbanding" proposal is designed to enable TA management to decide which first level supervisors are most eligible for promotion. Currently, promotion into each level of supervision up to the third level of supervision is based on competitive examination, outside of management's control. This proposal would allow management to control access to managerial positions and to use promotions as a means of rewarding superior performance.

The proposal to reclassify third and fourth level supervisory titles to managerial titles would allow the Transit Authority to create a new series of managerial titles that could be tailored specifically to the job to be done and compensated on the basis of the importance of that job. Not only would this allow the Authority to hire qualified candidates from outside of the Authority, but it would also enable management to dismiss or reassign managers who are not performing well.

The proposal to eliminate union representation from supervisory and managerial titles is based on the same standard that applies to the private sector as defined by the National Labor Relations Act. This standard defines supervisors as part of management and thus not eligible for collective bargaining.

This change will eliminate situations where the Authority is currently in the position of having second-level supervisors supervising people who are members of their own union. These conditions represent a real conflict of interest which would dilute the Authority's attempts to strengthen managerial accountability. This change will also strengthen the

Authority's bargaining position with those employees for whom
collective bargaining is appropriate.

For these changes to occur, two specific actions outside
the Authority must be taken:

- o Civil Service Commissions must agree to move several levels of supervisory positions from competitive to non-competitive status; and
- o legislative action must be taken to remove supervisors from collective bargaining.

The changes will have an impact on no more than 5000 of the Transit Authority's 44,000 employees. All of these incumbent employees will continue to have Civil Service protection. The number of top level managers exempt from both collective bargaining and competitive Civil Service will increase from 274 to approximately 600. This will enable the Authority to have accountable managers stationed in bus depots, car maintenance shops and other areas critical to transit operations.

The Surface Division has taken a step in this direction by initiating a program under which maintenance and transportation chiefs in each bus depot will develop, in consultation with their division superintendents and senior management of the Authority, goals in a number of areas. Each depot's performance in these areas will be monitored by Surface

management, and chiefs will be evaluated on the basis of the accomplishment of their goals. Those chiefs who meet their goals will receive merit bonuses of up to \$2,500. An agreement with the union representing depot chiefs has already been negotiated that permits pay differentials based on success in achieving performance targets.

2. Incentive Programs

Nearly half of the 44,000 employees working for the Authority are involved in providing service directly to the public. Most of these employees (such as bus and train operators, conductors, and subway clerks) work at locations throughout the City away from direct supervision. Thus the quality of the service provided by the Authority depends heavily on the skills of these employees and their sense of pride in the system. The institution of incentive programs throughout the Authority, accompanied by strong, clear leadership and technically competent managers and supervisors, could be instrumental in developing employee pride and, subsequently, more reliable service. The Surface Division is studying the possibility of development of a systemwide employee incentive program. The program will be based on the findings of the Depot Assistance Team, composed of union and management representatives, which has examined a variety of incentive programs during visits to other transit systems. The Team will develop and test a prototype incentive program at the 126th Street Depot.

Management accountability and adequate tools and training are the building blocks for goal development, program completion and improved service. Therefore, changing the organizational structure of the Transit Authority as outlined above is of the highest priority in the immediate future.

2. Administrative Systems

The Systems and Information Management Department has recently developed, or is in the process of developing, new computerized systems to assist managers with a broad range of production and planning tasks. Until now, these tasks have been done manually or have been ignored. However, even with the development of several new systems, the Transit Authority still has many critical areas which continue to rely on time consuming and often inaccurate manual methods of data collection. Furthermore, the systems that have been developed are not always used to their full potential or relevant to the Authority's needs. For example, the PRAP (Purchasing, Receiving, and Accounts Payable) system, which was instituted in 1977, can handle one third of the Authority's current purchasing workload. Temporary help had to be brought in to eliminate the procurement backlog resulting from a crash of the overused system in November 1983. In addition, the entire PRAP software must be transferred to reliable hardware while the potential for integrating PRAP with the Material Management System (MMS) is analysed. Therefore, the Transit Authority must not only continue to develop more administrative systems but must ensure that existing systems are appropriate and used effectively. As with any program, accountable management will be the key to successful administrative systems development.

The automated systems already in place include:

- o the budget and accounting systems;
- o a Labor Distribution System for determining and monitoring the resources needed to perform maintenance activities; and,
- o a stock status system for improving inventory control at all Car Maintenance, Surface Maintenance, and main storeroom facilities.

Automated systems under development include:

- o automated vehicle and crew scheduling for both buses and subways;
- o a maintenance-of-way database to schedule maintenance of track, structures, equipment, and power systems; and,
- o a system for scheduling maintenance and generating the necessary work order requests.

In addition to new systems development, some systems in place will be tied into each other in order to enhance their effectiveness. For example, when the computerized Materials Management System is integrated with the Purchase, Receiving, and Accounts Payable System, the Authority will be able to monitor inventory levels more efficiently and reorder commodities in a more timely manner. This should prevent the "cannibalization" of parts and the repair delays that have characterized the Authority's maintenance.

The Five Year Capital Program is an essential part of the plan to ensure the survival of the transit system. It consists of several broad programs and many discrete projects. The difficulty of successfully coordinating and executing this program while maintaining day-to-day operations, however, was not recognized when it was first undertaken. The program needs to be slowed down, examined, and then properly managed.

A Capital Program Review Committee, comprised of the Authority's Vice Presidents, has been established to determine Capital Program priorities and to change the scope and scheduling of capital projects, if necessary. The Five Year Capital Program is being revised by the Capital Program Committee to allocate funds to projects critical to operating reliability, safety, and cleanliness. This includes additional funds for track reconstruction, rail renewal, structure work, and bus depot rehabilitation (without precluding future replacement with large, new depots). In order to focus on the critical areas of vehicle reliability and halting further deterioration of the subway infrastructure, programs and projects not directly addressing these priorities are being given lower priority so as not to distract and dilute limited managerial and technical resources. This means that some of the more visible projects such as air conditioning and station modernization, that the public was expecting will have lower priority until more critical programs are successfully underway.

Management is not currently organized in a way that will ensure successful execution of even a slowed down Five Year Capital Plan. A project management system covering the 200 individual projects that will be under construction in 1984 and 1985 and the 150 projects that will be under design in 1984 and 1985 will be implemented. The Engineering Department is being reorganized so that Program Managers will be responsible for the following major areas of construction and reconstruction work:

- Barns, shops, and yards;
- Bus depots and facilities;
- Track, structures, and other subway system infrastructure;
- Stations;
- Signals and communication; and
- SIRT OA, new routes, and miscellaneous.

Within each program area, project managers will be assigned to plan, schedule, budget, monitor, and generally administer projects or groups of projects at specific locations. For instance, one project manager will be responsible for all projects at the Coney Island yard, shop, and Barn complex and another will be responsible for all bus depot rehabilitations. Project Managers will be responsible for projects from design through construction. They will ensure that scopes and cost estimates are accurate and adhered to, that schedules and milestone dates are met, and that component parts of projects are coordinated and meet the needs of line managers.

C. Operating Programs to Maintain the System in Good Working Order and to Provide Reliable Service

As the transit system is restored to a state of good repair through capital investments in rolling stock, infrastructure, and facilities, it is essential to operate and maintain it properly. During the next few years, while the Authority and its bus and subway passengers cope with the unpleasant and disruptive aspects of the Capital Program, and the possibility of further system deterioration and set-backs, some progress can be made in the way the Authority operates. As a first step, experienced, professional railroad and maintenance managers will be appointed to head up critical areas, such as Track and Structures and Car Equipment. Standards of performance must be radically improved and, as discussed above, the quality of work can be controlled only if managers throughout the Authority are qualified and can be held accountable for what they produce.

To the extent that operating programs are in place to ensure the survival of the system, other, more service-oriented programs can be addressed. Foremost will be proper cleaning of subway cars, buses, and stations, and attention to security matters. Improvement in basic amenities and conveniences such as maps, signs, public address announcements, and the smarter appearance of vehicles and facilities are also areas that require attention.

C. Highest Priority Operating Programs

The Transit Authority's highest priorities are to restore bus service to pre-Grumman-failure levels and to improve the quality of overhauls, rehabilitations, and inspections. The most important non-capital programs for ensuring the smooth operation of the transit system, are inspection and overhaul of subway cars and buses; and inspection and repair of track, signals, line equipment and structures. These activities, if done well, will permit adequate operations on the system while the capital program provides longer term improvements. The only people who can ensure that this work is done completely and thoroughly are the managers and supervisors who directly supervise the work. Thus, the change in management structure should have a noticeable impact on service through improved operating programs. It is also critical that the correct preventive maintenance cycles be established and met. The actions being taken to address these problems are described below.

1. Bus Fleet Program

To compensate for the withdrawal of 851 Grumman buses from service, the TA will lease 150 buses, completely rehabilitate 300-350 buses in the existing fleet, and purchase 400 GM buses in 1984. Fleet average age and overall reliability are expected to improve significantly through this program. By December 1984, the average age of the fleet will be reduced to 6.2 years (down from 7.5 years immediately following the

retirement of the Grumman Flexibles) and approximately 200 buses beyond the expected life of 12 years will be retired.

2. Subway Car Overhauls and Bus Rehabilitations

If overhaul and rehabilitation programs are well planned, realistically scheduled, and of high quality, car and bus fleet reliability will increase. In an effort to improve the existing overhaul and bus rehabilitation programs, the appropriate maintenance chiefs in the barns and depots will be held responsible for adhering to overhaul and rehabilitation schedules and for the performance of the vehicles in these programs.

The TA is beginning to regularly overhaul its subway cars through the Car Overhaul Program (COP). This program, begun in mid 1980, is designed to increase subway car reliability through the comprehensive overhaul of selected subway car types and the replacement of certain car systems that are subject to high failure rates. The production plans for these overhauls and the mileage intervals at which they are performed are shown below. (The average car travels approximately 45,000 miles per year.)

PlannedScheduled OverhaulsCY1983CY1984

CY1985

Level D (180,000 miles)

IRT	374	0
IND/BMT	366	464
TOTAL	740	464

Level E (360,000 miles)	279	280
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Level G (1,080,000 miles)

In-house	68	71
Vendor	176	112
TOTAL	244	183

The COP also includes replacements/retrofits as problems with car systems are identified. Partially through the COP, the Authority also will address chronic door problems that cause delays as passengers are forced to use a reduced number of operating doors.

Up to now, the COP has not advanced as planned, with deficiencies in parts procurement and missed schedules being the rule rather than the exception. The material deficiencies continue to be addressed by the suppliers and the Car Equipment and Material Departments. New standards of performance for overhauls are also being put in place. In the case of the Level E overhauls, a revised system to document deviations from the work scope is being developed to meet the needs of the Quality Assurance, Production, and Engineering groups.

Although the TA does not plan to regularly rehabilitate its buses, complete rehabilitations will be done to 300-350 older buses which are now being used to meet service requirements following the early retirement of the Grummans. These rehabilitations will be much more extensive than the more than 400 rehabilitations performed in the past. Previous bus rehabilitations were also not performed according to a cycle and were partial inasmuch as they did not attempt to replace all bus components prone to failure but only replaced some components on an "as needed" basis.

3. Subway Car and Bus Inspections

Routine daily pre-service inspections of the electrical systems and door systems can be effective in reducing the number of cars that break down or cause delays en route. At present, 218 road car inspectors do pre-service inspections on one-third of the trains required for service each weekday. As yard expansions make it possible to store cars in yards, it should be possible logistically to cover nearly all cars needed for service each day. This may be possible by 1989.

In addition to the pre-service checks, more thorough inspections are conducted in the repair barns. "A" inspections are performed every 5,000 miles; "B" inspections every 10,000 miles; and "C" inspections every 30,000 miles. Based on the same level of service, the following number of inspections should be performed and indeed are planned for CY1984 and

	<u>Planned CY '84</u>	<u>Planned CY '85</u>
Level "A"	30,000	30,000
Level "B"	20,000	20,000
Level "C"	10,000	10,000

The Transit Authority is very close to meeting its schedules for A, B, and C inspections.

Bus reliability also can be improved through periodic inspections. Bus inspections are currently performed at 3,000, 6,000 and 24,000 mile intervals. A major inspection is conducted every 28,000 miles in which the front and rear brakes and various suspension components are replaced. The table on page ___ indicates that the Authority is close to schedule for those inspections.

Although the schedules for both subway car and bus inspections are currently being met, it is not always clear whether these cycles are appropriate or whether every inspection procedure is actually completed. Car Equipment changed their existing inspection cycle in 1980 after studies indicated that a 10,000 mile A inspection was warranted. Currently, the Fleet Engineering staff in Surface is studying various inspection cycles to improve reliability. Some examples of potential changes are hourly based rather than mileage based inspection cycles, and performing the 24,000 mile inspection at the earlier intervals. And once again, it is necessary for barn and depot personnel to be directly responsible and accountable for the timely completion of all inspection procedures. This will help ensure that all inspections are complete and timely, and, subsequently, help to increase vehicle reliability.

4. New Bus Testing

To avoid problems similar to the Grumman fleet failure, Surface will institute a new bus testing program starting with the 1985 bus purchase. In this program, each bus manufacturer must provide a bus, free of charge, for one year of rigorous

testing in revenue service, in non-revenue field trials, and at private engineering test facilities. This program will help identify potential problems in new buses before they are purchased.

5. Track Program

Track maintenance activities are being reorganized to deploy adequately sized and skilled gangs to make effective track inspections and repairs. This will complement the extensive capital reconstruction and rail renewal activities, also underway.

6. Passenger Safety

In the past ten years, transit crime has increased dramatically. In order to combat this increase, sufficient police must be assigned to the bus and subway system and the Authority must support new programs to deter crime.

Since the Transit Police Department is completely funded by the City of New York, decisions about increasing the size of the Transit Police force are made jointly by the City and the Transit Authority. Fiscal limitations on the City's budget have, in past years, resulted in a decrease in Transit Police staffing. Nevertheless, by January 1985, the Transit Police will field the largest force in its history, 3,635 officers, an increase of 28% above the level in January, 1980, and effectively the same as the Transit Police's previous high in 1974, prior to the City's fiscal crisis.

As an additional means of increasing the security of passengers, the Transit Authority is spending \$18.6 million, as part of the Five Year Capital Program, to install 577 Off-Hours Waiting Areas where passengers may gather to wait for trains

during periods of relatively low ridership. The areas are brightly painted, well-lit, and in some cases have seating and closed circuit television. They are generally located on the same level as the token booth and in the token clerk's line of sight.

Three actions have been taken recently to improve the security of the bus system. First, the number of Transit Police officers assigned to the bus system was increased in 1983. Second, Transit Police officers are now being assigned to those areas or parts of routes that have experienced the highest levels of crime against bus operators. Third, the Transit Authority is currently repairing all radios on its buses to permit two-way communication with central dispatchers. The dispatcher will then be able to summon police assistance in the event of a crime or other emergency. As of mid-1983, prior to the commencement of the bus radio repair program, only 45% of the radios worked. The Capital Program contains \$31.2 million for the installation of new equipment, which should be operational at the end of 1986.

Programs to be Completed After Ensuring Completion of Priority Programs

The Transit Authority's current priorities are to develop effective programs to increase vehicle reliability and to halt deterioration of the infrastructure. However, the Authority recognizes that a clean and comfortable system will increase safety and encourage more riders to use the system. To the extent that resources and managerial capacity are available, the problem of cleaning all cars, buses, and stations will be

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addressed. In the meantime, new cars and buses, and overhauled cars and buses, which are painted "tuscan red", will be kept clean and graffiti-free. The process of implementing cleaning programs will be on an incremental basis, without expansion to large campaigns until we are sure we can control and manage the programs and achieve our goals. To maintain the cleanliness of the entire fleet, the Transit Authority will secure cars to deter vandals and will determine, schedule, and adhere to the proper cleaning and graffiti removal cycles. In addition to maintaining cleanliness and repair, it is important that the system remain comfortable for passengers, without being too hot, too cold, or too noisy. As with all operating programs, the appropriate personnel will be made responsible to ensure the quality of the passenger environment.

6. Fleet Security

The primary strategy to protect the Authority's trains from vandalism and graffiti is the elimination of mainline storage of subway cars. Presently, due to limited yard storage space, 156 trains, representing 33% of the fleet, are stored nightly on unsecured mainline locations. Upon the conclusion of the yard security and expansion program in 1989, mainline train storage will be limited to terminal locations and five secured underground locations. The Five Year Capital Program contains a total of \$207.1 million for the expansion of yards. Several serious logistical problems, such as the need to take tracks out of service while inspection barns are being reconstructed, must be overcome if this is to be accomplished.

Installation of security fencing has been completed at 19 train storage yards. The work includes a double line of 12 foot fencing around the yard perimeter and has razor ribbon wire on the top of and in between the fences. The Five Year Capital Program contains \$20.7 million for the secure fencing of yards, a program completed in 1983.

7. Cleaning and Other Amenities

a. Car and Bus Cleaning

The first step in the Authority's effort to keep subway cars and buses clean will be to require all new cars and buses, and all overhauled cars and rehabilitated buses, which are painted "tuscan red", to be clean and graffiti-free before they are used in revenue service. As new, overhauled, and rehabilitated vehicles are added to the fleet, the appearance of the fleet will gradually improve and the TA will learn the resources and strategies needed to keep vehicles clean. The TA will then be able to expand this program to the entire fleet.

The installation of utility tracks with chemical washers at all barns and of a new car wash at Coney Island was intended to make the job of cleaning cars easier. However, cleaning on utility tracks takes place during inspections. Since these inspections take 12 hours, cleaning is limited to one train every 12 hours. This will not be sufficient to maintain a clean, graffiti-free fleet. Therefore, further strategies need to be developed to reduce graffiti and litter in subway cars.

Station Cleaning

All stations are cleaned on a regular cycle that includes sweeping, pressure washing, and refuse removal. The cycles vary in length depending on the station's passenger volume. Despite the systematic nature of the cleaning program, the stations remain grimy.

In 1984, station cleaning personnel levels were increased by 69 positions (6%). With this addition, the Station Department can clean the 64 most heavily-used stations more frequently than in 1983, or once every 11 days as compared with once every 16 days in 1983. In addition, the Department has set up three "flying squads" to respond to particularly urgent cleaning situations throughout the system.

It is clear that even with these modest additions, the frequency of cleaning will be inadequate and that greater resources will have to be devoted to the effort if stations are to be kept clean and attractive.

c. Bus Cleaning

All of the depots will have automatic bus washers to clean the outsides of buses by the end of 1985. In addition, those automatic washers that have proven to be ineffective will be replaced. The funds for these improvements are in the Five Year Capital Plan.

There are plans to improve the supervision of bus cleaners as part of its overall program to strengthen supervision in the depots. With improved spans of supervisory control, the cleaning of bus interiors and exteriors will improve.

The programs and actions essential to halting the deterioration of the transit system and reversing the downward trend in service and operating performance will be put in place over the next 12 to 18 months. This includes the following:

- o examination of the Capital Program to assure that the funds are spent efficiently and effectively;
- o reorganization of most Authority departments to establish clear areas of responsibility and managerial accountability and to position the organization to start producing better service;
- o submission of legislation* to eliminate the dual layer of union and Civil Service protection that prevents the Authority from managing the transit system.

Indicators of the Authority's progress will be manifest in a number of ways in the next six to 12 months. Indicators of progress will include the following:

- o an increasing number of clean, attractive subway cars and buses;

* To be verified

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a slowing of the Capital Program to gain better control;

- o rail renewal and track reconstruction at a rate at least equal to the rate of deterioration and accelerating to a rate that also addresses the backlog of sub-standard track and rail;

- o identification of previously unrecognized problems, accompanied by realistic assessments and plans of actions necessary to make corrections, and regular reporting on the status of those actions;

- o goals for 1985 in the areas critical to halting deterioration and reversing the declines in service.

The Authority's ability to gain control of its property and operations will be measured by the success of the R-62 and "tuscan red" fleet maintenance programs. The first new R-62's will go into service in _____ and the fleet will increase at a rate of _____ per month. The first "tuscan red" train is expected to be put in service next fall (?), the "tuscan red" fleet will expand at the rate at which COP produces "G" (?) car overhauls. The "tuscan red" buses will begin in service in _____. They will initially be put in service in (boro) (?); as the number of overhauled and rehabilitated buses increases to _____ the buses will be in all (?) 20 depots and will be seen on most bus routes in 1985 (?).

Progress in reversing deterioration will be measured by the amount of rail renewed, track reconstructed, signals replaced, structure-miles reconstructed, drains and pumps installed, stations and structures painted, and line equipment replaced. As the Authority improves its quantity and quality of performance in these areas, MDBF, trains on-time, and other measures of service performance will improve. Given the extent of work to be done to recover from years of neglect, however, passengers cannot expect improved service performance for three to four years. Ridership will probably not increase in direct response to either progress in halting deterioration or improving service but only after the system is generally perceived as better.

The Transit Authority's monthly reports will track progress on critical issues, acknowledge problems and realistically assess the Authority's capacity to overcome them, and will include clear, precise action plans to address identified problems. Target dates and goals will not be set forth until we are sure they can be met; announced goals and target dates will be met.

The 1985 budget preparation process, which has begun internally will include goal setting and supporting work plans. The budget itself will be a management tool to plan, monitor, and control the business of operating the Transit Authority.

Improvement in the management of the Authority will be manifest by no longer putting forward lack of parts and poor workmanship as excuses for failure to meet goals. Goals will be set with recognition of lead-time and space and labor constraints; the procurement process will respond to the need for timely ordering and delivery of parts; sloppy and incomplete work will be avoided and eliminated by upgrading the skills of the workforce, better organization of work, and adherence to work performance standards.

There will be increased emphasis on quality of work at all levels and in all aspects of the Authority's business ranging from the filling out of purchase requisitions to diagnosing and correcting engine trouble to management reports. The public will see this in the appearance, safety, and reliability of the system only after quality has become part of the Authority's standard way of doing business. It will take time and progress towards this goal initially may be manifest by confusion, resistance, and reorganization as the vast Transit Authority institution adjusts to a new way of doing business.

The milestones described above should be used to evaluate the Authority's performance in regaining control of the system so it can start to better service and address the issues facing public transit in the next decade. Once again, the achievement of our ultimate goal of improving bus and subway service in New York City, is contingent upon the creation of an accountable management structure. To bring about this fundamental change in the Transit Authority's organization will require the support of elected officials and the public. This is an essential component for better mass transit in New York

city. With an accountable management structure armed with the resources it needs, sustainable progress toward achieving clean, reliable, and safe subway and bus service will finally be possible. Our riders deserve no less.
